PSYCHOLOGICAL AND PSYCHOPHYSIOLOGICAL MECHANISMS OF SELF-MUTILATIVE BEHAVIOUR

by

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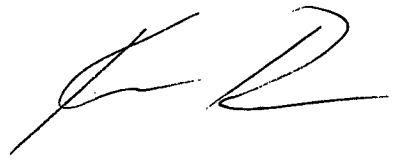

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ABSTRACT

The aim of this investigation was to clarify the processes that maintain self-mutilation in a sample of participants from the general community (n = 46). Specifically, 3 comparisons were conducted for each study.

Firstly, results obtained for male and female self-mutilation participants were compared. The self-mutilative behaviour of males and females traditionally has been considered to substantially differ, although this notion has not been empirically verified. The present investigation aimed to clarify this issue.

Secondly, results from individuals who were currently engaging in the behaviour were compared with a recovered self-mutilation group. Self-mutilation has been considered to be a behaviour that is extremely difficult to treat. It was anticipated that identification of factors associated with the cessation of self-mutilation would determine appropriate targets for treatment.

Thirdly, aspects of self-mutilation for participants who had frequently engaged in the behaviour were compared with those who had infrequently self-mutilated. Although it has been accepted to be a habitual behaviour, research regarding the factors that contribute to the development of repetitive self-mutilation has been limited. The present investigation aimed to clarify the factors assoicated with the development of a repetitive pattern of self-mutilation.

Where appropriate, comparisons between self-mutilation and non-self-mutilation groups were made. Five studies were conducted.

Initially, details regarding this sample's self-mutilative behaviour were determined via structured interview. The nature and extent of self-mutilation described by the present sample was consistent with previous reports indicating the generalisability of subsequent results. The self-mutilative behaviour of male and female and current and recovered participants was comparable.

Secondly, a range of psychometric measures were used to investigate the symptomatology associated with self-mutilation. Self-mutilation participants evidenced greater symptomatology than control participants. Limited sex differences were demonstrated. As expected, symptom severity and psychological distress were associated with repetitive self-mutilation. No significant differences between current and recovered self-mutilation participants were demonstrated for type or degree of symptoms presently experienced. However, the recovered group were significantly less distressed regarding the presence of symptoms. Results indicated that self-mutilation is not mediated by symptom severity alone. Investigation of behavioural motivation and the specific processes associated with the self-mutilative act were required in order to clarify the factors that maintain self-mutilation.

Using a self-report measure, the third study investigated motivations for self-mutilation. Tension reduction was the primary motive reported for engaging in the behaviour. In particular, motivations for infrequent self-mutilation were not well defined.

Results indicated that tension reduction associated with self-mutilation was maintaining the behaviour.

The fourth study investigated the specific tension reduction aspects of self-mutilation. Psychophysiological and psychological responses to self-mutilation were assessed using guided imagery depicting the self-mutilative act presented in stages (Haines, Williams, Brain & Wilson, 1995). Results demonstrated that self-mutilation is an effective tension reducing mechanism. For those who were currently engaging in the behaviour, imagery depicting the act triggered an immediate reduction in psychophysiological arousal and unpleasant feelings. However, the recovered group interpreted self-mutilation as psychologically distressing even though a significant psychophysiological arousal reduction was evident with commission of the act. No significant differences in the strength of psychophysiological arousal reduction associated with self-mutilation were evident between frequent and infrequent self-mutilation groups, however the psychological benefits of the act for the infrequent group were limited. These results indicated that factors other than tension reduction maintain the behaviour.

Using a self-report measure developed by the author, the final study investigated whether cognitive rehearsal of self-mutilation contributed to the performance of the behaviour. Results indicated that individuals do engage in cognitive rehearsal of self-mutilation and that this rehearsal contributes to the maintenance of self-mutilative behaviour.

In summary, results of this investigation have contributed to the understanding of the complex nature of the precipitants of self-mutilation. These results also have indicated that the purpose of the behaviour itself is quite straightforward. Implications of results for the management of self-mutilation are discussed and directions for future research are suggested.

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CHAPTER 1

INTRODUCTION TO THE INVESTIGATION

1.1 DEFINITION OF THE PROBLEM

For the purposes of this investigation the term self-mutilation was intended to incorporate deliberately inflicted, generally low lethality self-injurious behaviour of a socially unacceptable nature that is performed in the absence of conscious suicidal intent (Favazza & Conterio, 1989; Favazza & Rosenthal, 1993; Walsh & Rosen, 1988). This behaviour often is repetitive (Favazza, 1992; Favazza & Rosenthal, 1993) and represents a significant social and clinical problem (Favazza, 1996; Hawton & Blackstock, 1976; Maloney, Shah & Ferguson, 1987; Pattison & Kahan, 1983; Walsh & Rosen, 1988).

Self-mutilation has been observed in diverse psychiatric populations (Simpson, 1975; Siomopoulos, 1974; Takeuchi, Koizumi, Kotsuki, Shimazaki, Miyamoto & Sumazaki, 1986), incarcerated individuals (Feldman, 1988; Haines, Williams, Brain et al., 1995; Johnson & Britt, 1967; Winchel & Stanley, 1991; Yaroshevsky, 1975), and has been reported in persons representing every decade of life from the second to the seventh (Clendenin & Murphy, 1971). Therefore, a variety of disciplines from medical and psychiatric to corrective services have been confronted with self-mutilative behaviour (Feldman, 1988). Yet none have developed fully effective methods for managing this phenomenon (Feldman, 1988; Raine, 1982; Simpson, 1976; Thorburn, 1984).

Estimation of the incidence of self-mutilation has been problematic (Simpson, 1975; Walsh & Rosen, 1988). Reports considering incidence generally have been underinclusive (e.g.,

Clendenin & Murphy, 1971; Weissman, 1975) or overinclusive (e.g., Kahan & Pattison, 1984; Morgan, 1979) with regard to the range of behaviours that have been defined as self-mutilative. In one large review the prevalence of self-mutilation was estimated at between 14 and 600 persons per 100,000 population per year (Walsh & Rosen, 1988). Other estimates of the incidence of self-mutilation have been higher (e.g., Favazza & Conterio, 1988; Whitehead, Johnson & Ferrence, 1973).

By considering the rate of self-mutilative behaviour associated with a variety of psychiatric disorders and the prevalence of those disorders, Favazza & Conterio (1988) estimated the incidence of self-mutilation to be about 750 per 100,000 population per year. However, anecdotal evidence from the present investigation has indicated that for a substantial proportion of individuals self-mutilation and the symptoms associated with the behaviour are not severe enough to warrant psychiatric attention. Certainly, researchers have noted that a considerable number of individuals who self-mutilate never access psychiatric services (e.g., Favazza & Conterio, 1989). Therefore, it is likely that the true incidence of self-mutilation is much higher.

Estimation of the incidence of self-mutilation and the development of effective strategies for the management of the behaviour has been hampered by confusion regarding the definition of what constitutes self-mutilation. Some researchers have failed to distinguish between self-mutilation and behaviours which are clearly suicidal in nature (e.g., Freidman, Glasser, Laufer, Laufer &

Whol, 1972; Gossop, Cobb & Connell, 1975; Hawton & Blackstock, 1976; Robertson, Campbell & Crawford, 1987). Others have included highly lethal and relatively superficial self-injurious behaviours in the same category of self-mutilation (e.g., Morgan, 1979). Still others have narrowed the definition too far and referred only to wrist cutting (e.g., Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Kaplan & Fik, 1977; Pao, 1969; Simpson, 1975, 1976). These conflicting definitions of what constitutes self-mutilation have inhibited understanding of the self-mutilative process and the factors that maintain the behaviour.

Self-mutilation has been described as a complex behaviour that is notoriously difficult to treat (Feldman, 1988; Raine, 1982; Simpson, 1976; Thorburn, 1984; Walsh & Rosen, 1988). Current therapeutic approaches to self-mutilation have been based largely on anecdotal and descriptive information. Certainly, some treatment successes have been reported (e.g., Cautela & Baron, 1973; Cox & Klinge, 1976; Favazza, 1996; Jurgela, 1993; Kaminer & Shahar, 1987; Roback, Frayn, Gunby & Tuters, 1972; Rosen & Thomas, 1984). However, no single treatment method has effectively and consistently combated self-mutilation (Feldman, 1988; Raine, 1982; Simpson, 1976; Thorburn, 1984).

Much of the self-mutilation related research has been restricted to specific populations of people who self-mutilate. Research has focused exclusively on females who engage in the behaviour (e.g., Favazza & Conterio, 1989; Graff & Mallin, 1967;

Herpertz, 1995; Langbehn & Pfohl, 1993; Rosenthal, Rinzler, Wallsh & Klausner, 1972), inpatient populations (e.g., Darche, 1990; Gardner & Gardner, 1975; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Podvoll, 1969; Rosenthal et al., 1972; Roy, 1978; Simpson, 1975, 1976), specific diagnostic groups (e.g., Dulit, Fyer, Leon, Brodsky & Frances, 1994; Schaffer, Carroll & Abramowitz, 1982; Simeon, Stanley, Frances, Mann, Winchel & Stanley, 1992) and incarcerated samples (e.g., Bach-y-Rita, 1974; Haines, Williams, Brain et al., 1995, Haines, Williams & Brain, 1995; Haines & Williams, 1997; Johnson & Britt, 1967; Jones, 1986; Thorburn, 1984; Yaroshevsky, 1975). Although results of these investigations have clarified the understanding of factors associated with self-mutilative behaviour within specific populations, the generalisability of these results requires verification.

The habitual nature of self-mutilative behaviour has been well documented (Favazza, 1992; Favazza & Conterio, 1989; Favazza & Rosenthal, 1993; Favazza & Simeon, 1995; Gardner & Gardner, 1975; Graff & Mallin, 1967; Kahan & Pattison, 1984; Ross & McKay, 1979; Walsh & Rosen, 1988). An increasing risk to the individual has been noted as the behaviour becomes habitual (Bancroft & Marsack, 1977; Favazza & Conterio, 1988). However, little research attention has been devoted to the identification of specific elements that reinforce the behaviour and contribute to the development of a repetitive pattern of self-mutilation.

A range of theoretical explanations for self-mutilative behaviour have been proposed. However, the speculative nature

and multideterminants of some of these theories have made direct empirical investigation problematic (Bennun [sic], 1984). It is of particular interest that reports from diverse psychological disciplines consistently have described self-mutilation as an effective tension reducing mechanism (e.g., Arons, 1981; Bennun [sic], 1984; Siomopoulos, 1974). Researchers have theorised that the tension reduction that the act itself provides serves to reinforce self-mutilation and maintain the behaviour as an effective coping strategy (Favazza & Conterio, 1989). However, until recently this theory had not been tested. Empirical clarification of the specific reinforcement processes of the self-mutilative act has critical implications for the management of the behaviour.

Researchers have delineated the psychophysiological and psychological components of the self-mutilative act using guided imagery depicting an actual episode of self-mutilation (Haines, Williams, Brain et al., 1995). Results derived from an incarcerated self-mutilation sample have indicated that an immediate reduction in psychophysiological arousal occurs with the commission of the self-mutilative act. It was suggested that it is this immediate arousal reduction that serves to reinforce the behaviour (Haines, Williams, Brain et al., 1995). A lag between the reduction of psychophysiological arousal and psychological distress was evident (Haines, Williams, Brain et al., 1995). These results have indicated that the psychological benefits of the act are of secondary importance in maintaining self-mutilation as a behavioural response. This

research has clarified the reinforcement properties of self-mutilative behaviour and has important implications for the management of self-mutilation. However, the generalisability of these results to a broader population of people who self-mutilate is necessary.

Identification of the factors associated with a diminished need to engage in the behaviour also has therapeutic implications. A review of the literature has indicated a lack of structured research regarding aspects associated with cessation of self-mutilative behaviour. From a treatment perspective it is of value to determine whether the reinforcement associated with the act itself alters when an individual is no longer engaging in self-mutilation. Alteration of the reinforcement processes associated with the act itself may effectively control the need to engage in the behaviour.

The aim of the present investigation was to clarify the specific reinforcement properties of the self-mutilative act and to distinguish the aspects of self-mutilation that contribute to the development and maintenance of a repetitive pattern of behaviour. It was anticipated that identification of the reinforcement elements of self-mutilation and the factors associated with cessation of the behaviour would provide appropriate directions for the treatment of self-mutilation.

1.2 OVERVIEW OF THE INVESTIGATION

This investigation constituted an intensive design. In clinical research it is sensible to utilise the information that participants can provide regarding a range of factors associated with the behaviour in

question in order to develop an accurate overall impression of the problem behaviour (Grove & Andreasen, 1982). A nonpatient and outpatient sample of 46 people with a history of self-mutilation initially were recruited for participation in this research. For self-mutilation participants, three comparisons were made.

The overview that follows provides a description of the investigation. As a consequence of the fact that the argument for subsequent studies is built on the results of previous studies, some inclusion of results is warranted in this section.

Researchers traditionally have considered the self-mutilative behaviour of males and females to be phenomenologically different. Data from male participants often has been excluded from analyses on the basis that it has been considered atypical (e.g., Favazza & Conterio, 1989; Graff & Mallin, 1967; Herpertz, 1995; Langbehn & Pfohl, 1993; Rosenthal et al., 1972). Some researchers have presented self-mutilation related information derived from male and female samples separately (e.g., Zweig-Frank, Paris, & Gudzer, 1994a, 1994b). However, a direct comparison of the self-mutilative behaviour of males and females has not been made. It is important to determine any factors that do differentiate the self-mutilative behaviour of males and females so that management of self-mutilation and associated symptoms may be targeted effectively. A comparison of information derived from male and female participants in the present investigation aimed to clarify this issue.

As mentioned, self-mutilation provides a real challenge for treatment professionals (Favazza, 1996; Feldman, 1988; Simpson, 1976; Walsh & Rosen, 1988). Identification of the factors associated with cessation of the behaviour would provide important information regarding appropriate directions for treatment. In the present investigation, comparisons between individuals who were currently engaging in the behaviour and those who had recovered from the symptom of self-mutilation (i.e., had not engaged in the behaviour for more than 6 months) were conducted in an effort to identify specific factors associated with cessation of the behaviour.

As outlined earlier, the habitual nature of self-mutilative behaviour has been well documented (Favazza, 1992; Favazza & Conterio, 1989; Favazza & Rosenthal, 1993; Favazza & Simeon, 1995; Gardner & Gardner, 1975; Graff & Mallin, 1967; Kahan & Pattison, 1984; Ross & McKay, 1979; Walsh & Rosen, 1988). However, there has been little research regarding the specific elements that contribute to the development of a repetitive pattern of self-mutilation. Clarification of these factors is important in the identification of persons most at risk of developing a repetitive pattern of behaviour and in determining the most appropriate focus for early therapeutic intervention. In the present investigation aspects of self-mutilative behaviour were compared between individuals who engaged in the behaviour on a habitual basis (i.e., 5 or more lifetime episodes, Dulit et al., 1994) and those who had self-mutilated only on a few occasions (i.e., less than 5 lifetime events, Dulit et al., 1994).

Early researchers devoted considerable attention to the development of a profile of the typical individual who engages in self-mutilation (e.g., Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Pao, 1969; Rosenthal et al., 1972). More recently, researchers have detailed the nature and extent of the self-mutilative behaviour that the 'typical' self-mutilating individual utilises (Favazza & Conterio, 1989; Favazza, 1992; Favazza & Rosenthal, 1993). In order to determine the generalisability of the results of the present investigation, it initially was important to ascertain the nature and extent of self-mutilative behaviour of participants in this sample. In addition, it was necessary to ensure that any between group differences evident in the following studies were not influenced by intrinsic differences in the type of the behaviour being examined.

Results of the first study of this investigation indicated that the characteristics of the present self-mutilation sample were comparable with the typical self-mutilating individual who previously has been described. In addition, no differences between male and female or current and recovered self-mutilation participants were evident. Frequent self-mutilation participants reported having engaged in a broader range of self-mutilative behaviours than the infrequent group. This was not suprising given their more extensive self-mutilative history. No differences between frequent and infrequent self-mutilation participants were evident for instruments used, site of injury or severity of self-mutilation.

The phenomenology of self-mutilation has been well documented (Favazza, 1992; Favazza & Rosenthal, 1993; Feldman, 1988; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Pattison & Kahan, 1983; Simpson, 1976). However, systematic research regarding the specific components of the act itself has been limited. It is important to fully understand the mechanisms of the symptom of self-mutilation in order to successfully treat the behaviour.

A range of unpleasant feelings have been reported to precede the act of self-mutilation (Favazza, 1992; Grunebaum & Klerman, 1967; Kahan & Pattison, 1984; Simpson, 1976; Schwartz, Cohen, Hoffman & Meeks, 1989). Researchers have noted that individuals engage in self-mutilation in an effort to control this distressing emotional state (Favazza & Rosenthal, 1993). It makes sense to consider that the frequency of self-mutilation would vary as a function of symptom severity and that resolution of the symptoms associated with the behaviour would result in a diminished need to self-mutilate. The second study in the present investigation addressed these issues.

It was of particular interest that individuals who were no longer engaging in the behaviour had not necessarily recovered from the symptoms associated with self-mutilation. This result indicated that factors other than symptom severity influence the need to engage in self-mutilation. In order to clarify the factors that maintain the behaviour, closer investigation of the specific motivations for engaging in self-mutilation was required.

A range of motivations for engaging in self-mutilative behaviour have been documented (Bennum, 1983; Favazza, 1989a; Favazza & Conterio, 1989; Pattison & Kahan, 1983; Walsh & Rosen, 1988). In particular, researchers have noted that individuals self-mutilate in order to relieve feelings of intolerable tension (Bennum, 1983; Favazza & Conterio, 1989; Gardner & Gardner, 1975; Grunebaum & Klerman, 1967; Pattison & Kahan, 1983; Roy, 1978).

The present sample cited tension reduction as the primary motivation for self-mutilation. Motivations were less well defined for the infrequent self-mutilation group than for frequent self-mutilation participants. This result indicated that the beneficial aspects of the act of self-mutilation itself may strengthen as a function of behavioural repetition. It order to clarify this suggestion it was necessary to directly examine the specific tension reducing qualities of the self-mutilative act.

Direct examination of self-mutilative behaviour has presented methodological difficulties. It is neither practically nor ethically viable to assess an individual's responses to the self-mutilative act while he/she is actually engaging in the behaviour. Some other means of accessing this information obviously was required.

Research has demonstrated that a realistic response to the memory of an actual event effectively can be accessed using guided imagery (Acosto & Vila, 1990; Bauer & Craighead, 1979; Borkovec & Hu, 1990; Brain, Haines, Williams, Stops & Driscoll, 1996; Contrada, Hilton & Glass, 1991; Hirota & Hirai, 1986; Lang, 1979; Lang, Kozak,

Miller, Levin & McLean, 1980; Miller, Levin, Kozak, Cook, McLean & Lang, 1987; Pitman, Orr, Forgue, Altman, de Jong & Clairborn, 1987). Using guided imagery scripts presented in stages the psychophysiological and psychological processes of the self-mutilative act have been identified (Brain, Haines & Williams, in press, 1998; Haines, Williams, Brain et al., 1995). Results derived from an incarcerated self-mutilation sample indicated that the immediate reduction in psychophysiological arousal that the act of self-mutilation provides serves to reinforce the behaviour. The psychological benefits of the act were considered to be of secondary importance in maintaining self-mutilation as a behavioural response. The fourth study in the present investigation aimed to clarify the generalisability of these results to a broader population of individuals who self-mutilate.

Results suggested that the self-mutilative act provides an immediate decrease in both psychophysiological arousal and unpleasant affect. However, when an individual is no longer engaging in the behaviour, the psychological processes associated with the act are reinterpreted. In addition, results of the fourth study suggested that the self-mutilative act provides the same degree of psychophysiological arousal reduction for individuals who engaged in only a few self-mutilative episodes as for those who habitually utilised the behaviour. However, the interpretation of the psychological benefits that the act provides alters as the behaviour becomes habitual.

It was clear from the results of the fourth study that an alteration in the strength or pattern of psychophysiological reinforcement associated with the act of self-mutilation could not account for the cessation of self-mutilative behaviour. In addition, it was evident that factors other than the strength of the psychophysiological reinforcement that the act provides contribute to the development of a repetitive behavioural pattern. Results indicated that self-mutilation initially was experienced as a frightening event, associated with limited psychological benefits. It was apparent that repetition of the behaviour decreased the fear associated with the self-mutilative act. In addition, the psychological interpretation of the psychophysiological state that accompanies the act altered as self-mutilative behaviour became habitual. These results highlighted the importance of clarifying the role of cognitive processes associated with the behaviour in the development of a repetitive pattern of self-mutilation. The final study in the present investigation aimed to address this issue.

Researchers have emphasised the role of covert processes in behaviour acquisition (Cautela, 1976, 1977; Cautela & Baron, 1977; Driskell, Copper & Moran, 1994; Huesmann & Eron, 1984; Lennings, 1994). Results of the final study suggested that cognitive rehearsal contributes to the development and maintenance of a repetitive pattern of self-mutilative behaviour. In addition, results indicated that alteration of the covert processes associated with the act of self-

mutilation would contribute to the effective management of the behaviour.

As mentioned, self-mutilation traditionally has been considered a complex behaviour that presents treatment difficulties. Results of the present investigation have indicated that indeed the precipitating factors associated with the act of self-mutilation are quite elaborate. However, the purpose of the act itself and the processes that reinforce self-mutilative behaviour appear quite straightforward.

Results of the present investigation have supported the notion that a comprehensive treatment regime that targets the complex precipitants of the behaviour as well as the specific reinforcement mechanisms of the act itself would be most effective in combating self-mutilative behaviour. This is discussed in detail in the final chapter.

Prior to embarking on this investigation it was necessary to precisely define the behaviour in question. The following literature chapters aim to address this requirement.

CHAPTER 2

ATTEMPTED SUICIDE AND SELF-MUTILATION

Understanding of self-mutilative behaviour and the development of effective methods of treatment have been hampered by confusion regarding the definition of what constitutes self-mutilation. Historically, discussions of self-mutilation and suicide have emphasised the interrelatedness of these two behaviours. Some researchers have equated self-mutilative acts with those which are clearly suicidal in nature (e.g., Friedman et al., 1972; Gossop et al., 1975; Hawton & Blackstock, 1976; Robertson et al., 1987). Terms such as 'attempted suicide' (e.g., Hendin, 1950; Schmidt, O'Neal & Robbins, 1954; Stengel, 1964) and 'parasuicide' (e.g., Shneidman, 1985) illustrate that self-mutilation traditionally has been considered a derivative of suicidal behaviour (Walsh & Rosen, 1988).

In contrast, self-mutilation has been considered by some authors as counter suicidal (Favazza & Conterio, 1988; Ross & McKay, 1979; Simpson, 1976, 1981; Solomon & Farrand, 1996; Vesper, 1996) and self-mutilative behaviour has been described as a maladaptive coping strategy (Brain et al., in press, 1998; Haines, Williams, Brain et al., 1995; Solomon & Farrand, 1996). Self-mutilative acts have been reported to alleviate feelings of numbness and depersonalisation (Favazza, 1989a; Favazza & Rosenthal, 1993), to relieve tension and emotional distress (Brain et al., in press, 1998; Favazza & Conterio, 1989; Gardner & Gardner, 1975; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Haines, Williams & Brain et al., 1995; Herpertz, 1995; Pao, 1969; Solomon & Farrand, 1996), and to assist in regaining a sense of being alive (Walsh & Rosen, 1988).

Individuals who self-mutilate do make suicide attempts (Favazza, 1992; Herpertz, 1995; Langbehn & Pfohl, 1993; Schwartz et al., 1989). It has been suggested that these attempts are distinguishable from self-mutilative acts (Bach-y-Rita, 1974; Favazza, 1989b; Nelson & Grunebaum, 1971; Rosenthal et al., 1972; Solomon & Farrand, 1996; Stanley, Winchel, Molcho, Simeon & Stanley, 1992; Walsh & Rosen, 1988). Researchers have noted that when attempting suicide, individuals typically employ a different method from that which they use to self-mutilate (Favazza & Rosenthal, 1993; Rosenthal et al., 1972).

Some individuals may attempt or commit suicide after a number of years of self-mutilative behaviour (Pattison & Kahan, 1983; Robinson & Duffy, 1989). This has been attributed to two reasons. Firstly, the desperation of individuals to control repetitive self-mutilation may lead to true suicide attempts (Favazza & Conterio, 1989). Indeed, one study demonstrated that 32% of self-mutilation participants interviewed expected to be dead in five years (Favazza & Conterio, 1989). Secondly, as self-mutilative behaviour escalates, so does the risk of accidental death (Bancroft & Marsack, 1977; Favazza & Conterio, 1988). Furthermore, although it is not identified as a suicidal act, suicidal ideation commonly has been reported by individuals who self-mutilate (Favazza & Conterio, 1989; Pattison & Kahan, 1983).

Studies that have failed to distinguish self-mutilative from suicidal behaviours have unnecessarily complicated assessment and understanding of self-mutilation (Feldman, 1988; Walsh & Rosen, 1988) and this confusion undoubtedly has confounded treatment efforts

(Schwartz et al., 1989). It more commonly has been accepted that suicidal gestures are distinguishable from self-mutilative acts (Favazza & Favazza, 1987; Feldman, 1988; Gold, 1987; Grunebaum & Klerman, 1967; Langbehn & Pfohl, 1993; Novotny, 1972; Simpson, 1976; Solomon & Farrand, 1996). Indeed, individuals who self-mutilate have been reported as able to distinguish their self-mutilative acts from suicide attempts (Schwartz et al., 1989; Simpson, 1981; Solomon & Farrand, 1996) but this may not always be the case (Haines, Williams, Brain et al., 1995). Superficial lacerations have been described in terms of attempted suicide by individuals presenting at emergency medical services for treatment. It has been suggested that this reflects an attempt by the individual who self-mutilates to gain sympathy and avoid stigmatisation and punitive responses from professionals (Favazza & Conterio, 1989; Solomon & Farrand, 1996; van Moffaert, 1990; Walsh & Rosen, 1988). In addition, it has been noted that some individuals are unable to explain why they self-mutilate (Walsh & Rosen, 1988). It is likely that this reflects a lack of understanding of their own self-mutilative behaviour (Haines, Williams, Brain et al., 1995).

It does make sense to distinguish any given act of self-mutilation from one which is suicidal in nature. The treatment of a particular behaviour, for example, wrist cutting would differ greatly depending on whether it was considered to be a self-mutilative episode or a suicide attempt (Schwartz et al., 1989; Solomon & Farrand, 1996). Researchers have attempted to identify a range of factors that can reliably distinguish between self-mutilative and suicidal behaviours (Walsh &

Rosen, 1988). The following section discusses the applicability of each of these factors for the effective distinction between self-mutilative and suicidal behaviour.

2.1 SELF-MUTILATION AND ATTEMPTED SUICIDE

Walsh and Rosen (1988) have suggested that consideration of behavioural intent, lethality, repetition and methods of injury may effectively distinguish self-mutilation from attempted suicide. The applicability of each of these elements will be discussed in turn.

2.1.1 Intent

Definitions of self-mutilation typically have excluded acts with apparent suicidal intent (Favazza & Conterio, 1988; Feldman, 1988; Pattison & Kahan, 1983) and it makes sense to do so. However, assessment of self-destructive intent has been notoriously unreliable (Kennedy & Kreitman, 1973) and some authors have suggested that defining self-mutilation on the basis of intent is impractical (Morgan, 1979; Ross & McKay, 1979). Simply asking individuals to explain their motivation for self-mutilation may not be a reliable method to establish intent. In one study, 56% of 240 females admitted that they sometimes told others they felt suicidal when, in fact, all they wanted to do was harm themselves (Favazza & Conterio, 1989).

It has been noted that individuals who self-mutilate often are unable to provide an explanation for their self-mutilative behaviour (Walsh & Rosen, 1988). In addition, the complex processes associated

with any given act of self-mutilation may be open to reinterpretation when considered in retrospect (Brain et al., 1998). This is discussed in detail in Chapter 10. When no longer engaging in the behaviour, individuals may be more aware of the lack of the social desirability of self-mutilation and describe their intent with this in mind.

Traditional measures of suicidal intent have been problematic when applied to the intent associated with self-mutilation (Haines, Brain & Williams, 1998). Measures of suicidal intent typically have incorporated the circumstances surrounding the act to establish a total intent score. Endorsement of items assessing isolation at the time of the act, timing so that intervention is unlikely, taking precautions against discovery, and not acting to gain help following the behaviour have been interpreted as being indicative of an act that is suicidal in nature (Beck, Morris & Beck, 1974; Pierce, 1977, 1981).

Reports have indicated that just prior to self-mutilation individuals usually seek solitude if not already alone (Feldman, 1988; Gardner & Gardner, 1975; Simpson, 1976). In addition, the reluctance of individuals who self-mutilate to notify and seek help from others has been documented (Favazza & Conterio, 1989; Simpson, 1976). It is likely that these actions represent more a desire for privacy than suicidal intent. Recognition of these characteristics of self-mutilation may result in artificially high estimates of suicidal intent associated with self-mutilation as measured by the available scales for assessing suicidal intent (Haines et al., 1998).

In fairness to the authors, currently available measures of suicidal intent were designed for use with people who had attempted suicide and not self-mutilating individuals. At present there are no standardised instruments for measuring the intention associated with self-mutilation (Haines et al., 1998).

However, attempts to determine motivation as a distinguishing factor of self-mutilative behaviour should not be abandoned (Walsh & Rosen, 1988). Research has indicated that individuals have a variety of motivations for engaging in self-mutilation (Bennum, 1983; Favazza, 1989a; Favazza & Conterio, 1989; Pattison & Kahan, 1983; Walsh & Rosen, 1988). These motivations will be discussed in detail in Chapter 9. In particular, the use of self-mutilative behaviour as an effective tension reducing mechanism rather than for suicidal purposes commonly has been reported (Favazza & Simeon, 1995; Gardner & Gardner, 1975; Haines, Williams, Brain et al., 1995; Pattison & Kahan, 1983; Simeon et al., 1992). It has been suggested that clarification of behavioural intent provides the key to understanding self-mutilation (Walsh & Rosen, 1988).

2.1.2 Lethality

The degree of physical damage inflicted has been identified as a feature distinguishing self-mutilative and suicidal acts (Walsh & Rosen, 1988). Reports have indicated that self-mutilative injuries typically are of low lethality and unlikely to result in death (Favazza & Simeon, 1995; Feldman, 1988; Pattison & Kahan, 1983; Ross & McKay, 1979; Simpson,

1976). Interviews with 139 people admitted to hospital for a suicide attempt indicated low levels of suicidal intent for wrist cutting and self-poisoning. Much higher levels of suicidal intent were associated with higher lethality behaviours such as hanging (Nielson, Stenager & Brahe, 1993). Researchers also have noted that individuals who attempt suicide typically engage in acts with a high probability of death indicating their suicidal intent (Kahan & Pattison, 1984).

However, as self-mutilative behaviour becomes habitual the risk to the individual does increase. There is an increased likelihood of accidental death with repeated risk taking behaviour, as behavioural repetition may have a desensitising effect permitting greater risks to be taken with each subsequent episode (Bancroft & Marsack, 1977; Favazza & Conterio, 1988). This has been demonstrated with other low lethality self-harm behaviours. One study comparing aspects of completed suicide and parasuicidal behaviour demonstrated that 28% of participants who completed suicide had a history of previous hospital admission for parasuicidal behaviour, most often self-poisoning (Garzotto, Buglass, Holding & Kreitman, 1977). The greater proportion of the individuals with a parasuicidal history died from self-poisoning. In contrast, individuals who committed suicide and had no history of parasuicidal behaviour had more often died from poisoning with domestic gas or other highly lethal violent means (e.g., gun shot).

However, even consideration of suicidal intent by a factor as readily observable as the lethality of the behaviour is problematic. Research has demonstrated that people with alcohol dependence

problems have made highly lethal suicide attempts yet have achieved low scores for measures of suicidal intent (Nielson et al., 1993). A correlation between measured suicidal intent and behavioural lethality was evident only for people without a history of alcohol dependence.

Research also has indicated that the suicide attempts made by individuals who self-mutilate are of lower lethality than attempts made by individuals with no history of self-mutilation (Langbehn & Pfohl, 1993). It is difficult to determine whether so called suicide attempts represent an extension of self-mutilative behaviour for these individuals or whether they constitute a real attempt to die. Degree of physical damage inflicted provides an incomplete guide to suicidal intent (Nielson et al., 1993).

2.1.3 Behavioural repetition

Chronic repetition of self-mutilative behaviour has been well documented (Favazza & Conterio, 1988, 1989; Gardner & Gardner, 1975; Graff & Mallin, 1967; Kahan & Pattison, 1984; Morgan, 1979; Ross & McKay, 1979). In fact, a repetitive self-mutilation syndrome has been proposed (Favazza, 1992; Favazza & Rosenthal, 1993). The characteristics of this syndrome will be discussed in Chapter 3. A repetitive behavioural pattern has been reported to be markedly less frequent for individuals who attempt suicide (Walsh & Rosen, 1988).

Consideration of behavioural repetition may clearly distinguish self-mutilation from high lethality, serious suicide attempts. However, this distinction becomes less clear when a comparison with lower

lethality parasuicidal behaviours is contemplated. For example, a repetitive pattern of behaviour has been noted for self-poisoning (Bancroft & Marsack, 1977; Buglass & Horton, 1974; Hjelmeland, 1996; Kennedy & Kreitman, 1973; Kreitman & Casey, 1988; Robertson et al., 1987; Sakinofsky & Roberts, 1990; Sakinofsky, Roberts, Brown, Cumming & James, 1990; Wilkinson & Smeeton, 1987).

One large study of 690 hospital admissions identified 3 types of self-poisoning behaviour; 1) chronic repetition, where self-poisoning is considered to be a habitual method of coping with stressful situations; 2) bursts of repetition, where self-poisoning occurs during times of crisis; and 3) 'one-off' self-poisoning that occurs at a time of severe crisis and is rarely repeated (Bancroft & Marsack, 1977). The authors stated that repetition of parasuicide represents the establishment of a maladaptive pattern of coping. Other researchers have noted that for some individuals who engage in parasuicide, the behaviour represents a coping strategy (e.g., Sakinofsky et al., 1990). In this manner, self-poisoning resembles self-mutilative behaviour that is adopted by the individual as a dysfunctional coping strategy.

Multiple suicide attempts have been reported by a proportion of individuals who habitually self-mutilate (Langbehn & Pfohl, 1993). When compared with a group of people with no history of self-mutilation who had attempted suicide, significantly more self-mutilation participants reported five or more suicide attempts, usually by self-poisoning (Langbehn & Pfohl, 1993). Research has indicated that

suicidal intent decreases with subsequent episodes for individuals who engage in multiple incidents of self-harm (Pierce, 1984).

The motives for self-poisoning behaviour have been described as notoriously difficult to establish (Bancroft & Marsack, 1977). In addition, research has demonstrated that individuals repeat parasuicide even when the original problem or reason for engaging in the behaviour has been resolved (Sakinofsky & Roberts, 1990). Self-poisoning has been considered by health care professionals to be a 'suicidal gesture' rather than a real suicide attempt (Kennedy & Kreitman, 1973). It may be that for some individuals who self-mutilate, self-poisoning represents part of a broader self-harm phenomenon that is not necessarily suicidal in nature.

2.1.4 Method of injury

Reports have indicated that individuals who self-mutilate utilise a range of self-injurious behaviours (Ballinger, 1971; Favazza & Rosenthal, 1993; Herpertz, 1995; Langbehn & Pfohl, 1993; Kahan & Pattison, 1984; Morgan, 1979; Ross & McKay, 1979; Schwartz et al., 1989). In one literature review, it was reported that 63% of individuals who had self-mutilated employed multiple methods of injury (Pattison & Kahan, 1983). In a study of 240 females with a history of self-mutilation, 75% reported they had engaged in multiple methods of low lethality self-injurious behaviour (Favazza & Conterio, 1989). In contrast, it has been suggested that individuals who have attempted suicide more than once typically have reported using the same method

each time (Walsh & Rosen, 1988). However, this conclusion may have been the result of a sampling bias.

A review of the literature has indicated that most of the research regarding attempted suicide pertains to self-poisoning. As mentioned, a repetitive pattern of self-poisoning behaviour has been noted. In terms of attempted suicide, self-poisoning is one of the few methods that represents a variable risk to life (Favazza & Rosenthal, 1993; Walsh & Rosen, 1988). To a large extent, lethality of self-poisoning depends on the knowledge of the individual regarding the dangerousness of the substance and the dosage required for that substance to be toxic. In addition, research has indicated some variability between people regarding motivation for self-poisoning (Bancroft & Marsack, 1977). For some individuals, self-poisoning may serve as a maladaptive coping strategy and for others it may represent a real attempt to die. It is suggested that a repetitive pattern of higher lethality behaviours such as hanging or gun shot generally has not been noted because it is less likely that people who attempt suicide using these methods will survive to engage in future attempts.

2.1.5 Summary

In summary, researchers have proposed that consideration of behavioural intent, lethality, repetition, and methods of injury may enable self-mutilative acts to be distinguished from those which are suicidal in nature (Walsh & Rosen, 1988). The utility of these variables have been investigated in practice (Walsh & Rosen, 1988). Fifty-two

adolescents at an inpatient facility engaged in 293 episodes of self-mutilation. Most of these self-mutilative acts were low lethality behaviours. Only two individuals caused themselves a marked degree of physical damage. For 60% of individuals, self-mutilation was considered to be a chronic behaviour (chronicity defined as 5 or more self-mutilative episodes). Half of this sample utilised multiple methods of injury. Wrist cutting and self-hitting were most commonly observed. Burning with cigarettes, wound excoriation, head banging and hitting objects also were noted. Suicidal intent associated with self-mutilation was reported by 13% of this sample. However, only one percent of individuals were considered by staff at the facility to be suicidal at the time of self-mutilation.

The variables described by Walsh and Rosen (1988) may have some utility in distinguishing individuals who attempt suicide from those who self-mutilate. In some circumstances this distinction may be quite straightforward. However, often they are insufficient to make an accurate distinction between an act of self-mutilation from one which is suicidal for any given individual. For example, a low lethality act (e.g., wrist cutting) may have different meanings for an individual at different times (Solomon & Farrand, 1996). As outlined earlier, the intended meaning of the act is not easily determined. In addition, although multiple methods of injury have been reported by a large number of individuals who self-mutilate, this is by no means universal (Clendenin & Murphy, 1971; Favazza & Conterio, 1989). It is clear that additional

factors are required to accurately distinguish between self-mutilative and suicidal behaviours.

A plethora of reports has described the characteristics of self-mutilative and suicidal behaviour. In particular, a range of characteristics common to individuals who attempt suicide have been identified (Shneidman, 1985). Considering these suicidal characteristics, points of distinction between self-mutilation and suicidal behaviours have been proposed (Walsh & Rosen, 1988). The following section details these distinctive aspects of self-mutilative and suicidal behaviours.

2.2 COMMON BEHAVIOURAL CHARACTERISTICS

Shneidman (1985) proposed that suicidal individuals typically share ten common behavioural characteristics. In contradistinction to these ten elements, Walsh and Rosen (1988) have proposed ten features as characteristic of individuals who self-mutilate. Table 1 concisely illustrates these points of divergence between suicide and self-mutilation.

Table 1.
Comparison of 10 common characteristics of suicidal versus self-mutilative acts.

Common characteristic	Suicide	Self-mutilation
Stimulus	Unendurable psychological pain	Intermittent, escalating psychological pain
Stressor	Frustrated psychological needs	Deferred psychological needs
Purpose	Seeking a solution to an over bearing problem	Achieving short-term alleviation
Goal	Cessation of consciousness	Alteration of consciousness
Emotion	Hopelessness-helplessness	Alienation
Internal attitude	Ambivalence	Resignation
Cognitive state	Constriction	Fragmentation
Interpersonal act	Communication of intention	Coercion
Action	Egression	Reintegration
Consistency	Lifelong adjustment patterns	Lifelong adaptive patterns

(Walsh & Rosen, 1988, p.42)

From this analysis it is clear that self-mutilation and attempted suicide are similar only from a general perspective. Both self-mutilative and suicidal behaviours reflect maladaptive coping strategies that occur as a reaction to psychological distress (Walsh & Rosen, 1988). However, as Table 1 has illustrated, even in these basic elements the behaviours differ. For example, the stressors experienced by individuals who self-mutilate tend to be short term rather than the enduring distress typically reported by suicidal individuals. Individuals who self-mutilate have reported utilising self-injury for the purpose of tension reduction

(Favazza & Simeon, 1995; Gardner & Gardner, 1975; Haines, Williams, Brain et al., 1995; Pattison & Kahan, 1983; Simeon et al., 1992) and coping with intense emotional distress (Solomon & Farrand, 1996). In contrast, suicidal individuals aim to cope with their distress by escaping entirely (Walsh & Rosen, 1988).

Generally, the differences between suicidal and self-mutilative behaviour are quite clear. For example, reports have indicated that the enduring feelings of helplessness experienced by suicidal individuals are accompanied by a constriction of cognitive processes that precipitate an ambivalence towards death as suicide is considered the only option (Shneidman, 1985; Walsh & Rosen, 1988). In contrast, self-mutilation represents a response to periodic and acute distress. Individuals who self-mutilate recognise that they can quickly and effectively relieve these feelings and anticipate this desirable outcome (Podvoll, 1969; Simpson, 1976). Any relief experienced by suicidal individuals is restricted to speculation prior to the act. For those who self-mutilate, cognitions are not constricted to same the degree as for suicidal individuals. Also, rather than ambivalence, people who habitually self-mutilate have expressed resignation regarding their self-mutilative behaviour (Walsh & Rosen, 1988).

This analysis has provided a useful point of reference for the distinction between self-mutilation and attempted suicide. In theory the differences between suicidal and self-mutilative behaviours may be explicable. However, for the reasons summarised in the following section, in practice it is not always a simple matter to distinguish an act

of self-mutilation from a suicide attempt. Further efforts to develop an effective means of distinguishing between self-mutilative and suicidal behaviours should not be abandoned.

2.3 SUMMARY AND CONCLUSIONS

Self-mutilative and suicidal acts are best viewed as distinct entities (Stanley et al., 1992). Certainly, the management of any given behaviour will vary according to whether that behaviour is considered to be self-mutilative or suicidal in nature. However, a reliable distinction between an act of self-mutilation and one of attempted suicide may not be easy to establish for a number of reasons. Self-mutilation does represent a significant risk to life. The risk of accidental death increases as the behaviour becomes habitual. In addition, individuals who self-mutilate do make serious suicide attempts. The same act (e.g., wrist cutting) may have different meanings for the individual at different times (Solomon & Farrand, 1996). However, it is not clear that individuals are universally able to differentiate their self-mutilative and suicidal behaviours.

Although any given suicidal act may be distinguishable from one of self-mutilation, a behavioural continuum of self-mutilative and suicidal behaviour has been indicated (Stanley et al., 1992; Walsh & Rosen, 1988). Some individuals who self-mutilate also engage in multiple suicide attempts (Langbehn & Pfohl, 1993; Pierce, 1984). In addition, reports have indicated that some parasuicidal individuals utilise behaviours that resemble self-mutilation in factors such as

behavioural motivation, repetition and lethality (Bancroft & Marsack, 1977; Sakinofsky & Roberts, 1990; Sakinofsky et al., 1990). Furthermore, although it is not considered to be a suicidal behaviour, suicidal ideation often has been reported by people who self-mutilate (Kahan & Pattison, 1984). This further indicates an overlap between self-mutilative and suicidal behaviour (Favazza & Conterio, 1989; Pattison & Kahan, 1983). Therefore, it is proposed that suicide and self-mutilation be interpreted as separate but overlapping entities.

Even disregarding behaviours that are obviously suicidal in intent, a vast range of behaviours have been considered self-mutilative. In order to effectively investigate any given behaviour, it is important to clearly define the behaviour in question. A review of the literature has demonstrated confusion concerning a definition of self-mutilation. Some researchers have included highly lethal behaviours such as hanging, gun shot and relatively superficial self-injury such as skin cutting in the same class of deliberate self-harm (e.g., Morgan, 1979). Others have narrowed the definition too far and have considered only episodes of wrist cutting as self-mutilative (e.g., Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Kaplan & Fik, 1977; Pao, 1969; Simpson, 1975, 1976). Such conflicting descriptions of self-mutilation have inhibited the understanding of the self-mutilative process and hampered effective treatment of the behaviour. Therefore, clarification of a precise working definition of self-mutilation is essential.

The following chapter outlines the various attempts that have been made to define self-mutilation and to classify the behaviour, with

the aim of determining a practical definition of self-mutilation to be applied in this investigation.

CHAPTER 3

CLASSIFICATION AND DEFINITION OF SELF-MUTILATIVE BEHAVIOUR

3.1 CLASSIFICATION OF SELF-MUTILATION

A review of the literature has indicated that a vast range of behaviours have been considered self-mutilative. To complicate matters, as noted in Chapter 2, some researchers have included highly lethal and obviously suicidal behaviours such as gun shot in the same category of behaviour as acts that generally carry little risk to life such as delicate wrist cutting (e.g., Friedman et al., 1972; Gossop et al., 1975; Hawton & Blackstock, 1976; Robertson et al., 1987). Research that has failed to appropriately classify self-mutilative behaviour has undoubtedly restricted the value and application of results, hampered understanding of self-mutilation and complicated the development of effective treatment strategies.

Appropriate classification of self-mutilative behaviour provides a focus for effective treatment that is based on clinical and research experience. Researchers have attempted to classify self-mutilation in a number of ways, for example, by population (Winchel & Stanley, 1991), physical description of the behaviour (Ross & McKay, 1979), behavioural motivation (e.g., Henderson et al., 1977; Henderson & Lance, 1979) and site of injury (Rosen & Heard, 1995). Certainly, some of these classification methods have more practical application than others. What follows is a review of a number of methods that have been proposed to classify self-mutilative behaviour. The list presented here is by no means exhaustive but aims to provide an overview of the general issues

that have been considered with regard to the classification of self-mutilation.

Initially, Menninger (1935) classified self-mutilative behaviour according to: (1) the extent or type of psychological or physiological dysfunction, (2) the subcultural context in which the self-mutilation occurs, (3) the degree of physical damage and the position of the injury on the body, and (4) the specific psychodynamic determinants of the behaviour. Menninger (1935) distinguished six categories of self-mutilation; neurotic (nail biting, skin picking), religious, puberty rites, psychotic, organic and 'normal' self-mutilation (e.g., nail clipping) were described.

Menninger's (1935) classification system represented the first attempt to classify self-mutilative behaviour. However, in practical terms its application is limited. The categories described were not mutually exclusive, for example, religious and puberty rites were interrelated. In addition, consideration of grooming behaviours (e.g., nail clipping) as self-mutilative is problematic as it implies a degree of physical damage that is out of keeping with normal grooming.

A number of attempts since have been made to classify various forms of self-mutilative behaviour as distinct clinical syndromes. Early researchers suggested classification of wrist cutting as a separate syndrome (e.g., Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Pao, 1969). Later, large epidemiological studies demonstrated that categorisation of a wrist cutting syndrome is questionable (Clendenin & Murphy, 1971; Weissman, 1975). Further

attempts to incorporate a wide range of self-injurious behaviours in a deliberate self-harm syndrome (e.g., Kahan & Pattison, 1984; Morgan, 1979; Pattison & Kahan, 1983) also have been problematic. The following review describes these attempts to classify self-mutilation.

3.1.1 Wrist cutting syndrome

Skin cutting, ocular and genital mutilation have been the most frequently documented forms of self-mutilation (Feldman, 1988). Reports have indicated that skin cutting is the most common type of self-mutilative behaviour (Favazza & Conterio, 1989; Feldman, 1988; Fruensgaard & Flindt Hansen, 1988; Ross & McKay, 1979). Ocular and genital mutilation are much rarer but have been commonly reported due to the bizarre nature of these behaviours (Tantam & Whittaker, 1992). Skin cutting is distinguishable from these other bizarre and more damaging forms of self-mutilation that most often have been performed by psychotic individuals, mutilating in response to disordered thoughts and perceptions (Simpson, 1976; Tantam & Whittaker, 1992).

Early research regarding self-mutilation generally was conducted in inpatient psychiatric facilities and concentrated on people who repeatedly cut their wrists (Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Nelson & Grunebaum, 1971; Pao, 1969; Rosenthal et al., 1972). Some authors have claimed that wrist cutting is not only distinguishable from ocular and genital mutilation, but

that it should be categorised as a separate psychiatric disorder (Graff & Mallin, 1967; Pao, 1969).

Early attempts to distinguish wrist cutting as a distinct clinical syndrome concentrated on establishing a profile of a 'typical' person who engaged in wrist-cutting. A 'typical' wrist cutting individual was described as a 'young, attractive, intelligent, unmarried female' whose early life and family relationships were unstable (Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Rosenthal et al., 1972). The mothers of such individuals commonly were described as cold and domineering and the fathers as withdrawn yet 'intermittently indulgent' (Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Pao, 1969). In addition, individuals who engaged in wrist cutting were reported to be either promiscuous or overtly afraid of sex, as having an addictive personality, poor impulse control, and as being unable to relate successfully with others (Grunebaum & Klerman, 1967). Further emphasis was placed on childhood experience with illness and surgery (Pao, 1969). Difficulties with sexuality and menstruation also were cited as significant (Rosenthal et al., 1972; Simpson, 1976).

The profile outlined by these early studies was based on small sample sizes (e.g., Graff & Mallin, 1967; Pao, 1969) or relied on a series of single case descriptions (Grunebaum & Klerman, 1967). Research in which larger sample sizes were employed discussed factors that were incompatible with an exclusive wrist cutting syndrome (e.g., Clendenin & Murphy, 1971; Weissman, 1975) although these also were problematic. This will be discussed in detail later.

Other research endeavoured to compare individuals who cut their wrists with a control self-mutilation sample (Rosenthal et al., 1972; Simpson, 1975). However, the comparison groups for these studies consisted mostly of individuals who had engaged in self-poisoning. Results demonstrated significant differences on a number of factors between these groups (Simpson, 1975). However, these results have contributed little to the understanding of wrist-cutting behaviour. A comparison of individuals who cut their wrists with people who lacerated other parts of their bodies or who engaged in self-mutilative behaviours with similar characteristics in terms of lethality and motivation (e.g., self-burning) would have been more useful in an investigation of wrist cutting as a distinct clinical entity.

One study compared 22 females who had cut themselves with 22 non-psychotic psychiatric inpatients with no history of self-mutilation, matched for age, socioeconomic status and hospital ward (Gardner & Gardner, 1975). Of particular note was the lack of difference between the groups in terms of clinical and biographical factors. The authors concluded that the description of the 'typical' wrist cutting individual would apply equally well to a random selection of non-mutilating, non-psychotic, psychiatric inpatients (Gardner & Gardner, 1975).

The wrist cutting profile also was based on a sampling bias (Clendenin & Murphy, 1971). Males who cut themselves generally were viewed as atypical and excluded from these early studies (Graff & Mallin, 1967; Rosenthal et al., 1972) although this was not

universal (Pao, 1969; Roy, 1978). In one sample of 27 individuals who cut themselves, 23 were female. The skin cutting behaviour of the remaining 4 male participants was not reported as distinct from that of the females and their results were included in the general discussion of the syndrome of delicate self-cutting (Pao, 1969).

Early research dealt almost exclusively with patients in private hospitals, where the 'typical' wrist-cutting individual outlined would most likely be found (Clendenin & Murphy, 1971; Weissman, 1975). Researchers have suggested that males who cut themselves are more likely to enter public rather than private hospitals, or the criminal justice system (Clendenin & Murphy, 1971).

Skin cutting is not exclusive to young females. One study of only 10 male subjects distinguished between coarse and delicate skin cutting in male participants (Kaplan & Fik, 1977), similar to the distinction established by Pao (1969). Coarse cutting was categorised as suicidal. This behaviour included deep lacerations across major arteries that were apparently made in a deliberate attempt to die. The description of delicate self cutting was similar to that outlined by other authors (e.g., Graff & Mallin, 1967; Pao, 1969; Simpson, 1975, 1976) and included short, narrow cuts and superficial skin scratching (Kaplan & Fik, 1977). In larger epidemiological studies (Clendenin & Murphy, 1971; Weissman, 1975) 40% of participants who cut their wrists were male, and although more often young, wrist cutting was not exclusively the domain of the young. Therefore, the traditionally

accepted profile of a typical wrist cutting individual was considerably weakened.

It has been noted that the majority of individuals who cut themselves lacerate the wrist opposite to their dominant hand (e.g., Takeuchi et al., 1986), suggesting that the wrist is an injury site chosen for convenience sake. Rather than implying an underlying psychopathology peculiar to persons who habitually cut their wrists, wrist cutting should be interpreted as one form of a wider self-mutilative phenomenon. Whereas the wrists and forearms most commonly have been subjected to self-cutting, almost every other part of the body has been lacerated (Rosenthal et al., 1972; Simpson, 1976; Takeuchi et al., 1986).

Researchers have reported that individuals cut their wrists in order to relieve mounting feelings of intolerable tension, a pattern stemming from early maternal deprivation, embedded in an inability to give and receive meaningful verbal communications (Graff & Mallin, 1967; Grunebaum & Klerman, 1967). However, reports have indicated that the widely documented tension reducing properties of self-mutilation are not exclusive to wrist cutting (Favazza & Conterio, 1989; Pattison & Kahan, 1983; Rosenthal et al., 1972; Walsh & Rosen, 1988). One study of 23 wrist cutting participants reported that almost half also had engaged in other forms of self-mutilation including self-burning, skin carving, scratching, gouging, rubbing glass fragments into the face, and repetitive retraumatising of fresh fractures (Rosenthal et al., 1972). In a later study of 240 self-

mutilating females, skin cutting accounted for 72% of all self-mutilative acts. However, 75% of this sample utilised multiple methods of self-mutilation including skin burning (35%), self-hitting (30%), wound excoriation (22%), severe skin scratching (22%), hair-pulling (10%), and bone breaking (8%) (Favazza & Conterio, 1989).

Early studies achieved much in terms of a distinction between habitual, delicate self-cutting that was not suicidal in nature from that which clearly may be labelled attempted suicide. Although larger, epidemiological studies were more methodologically sophisticated, this distinction between suicidal and non-suicidal behaviour was not always clear (e.g., Clendenin & Murphy, 1971; Weissman, 1975), fostering further confusion regarding the classification of self-mutilative behaviour.

In summary, the profile of the 'typical' wrist cutting individual derived from early self-mutilation research was based on small samples and may be considered the result of a sampling bias. Although the wrists and forearms are most commonly subjected to laceration, it is likely that this is a site chosen for the sake of convenience. In addition, reports have suggested that the tension reducing properties that have consistently been described as associated with the act of wrist cutting are not exclusive to this behaviour, nor to skin cutting in general (Favazza & Conterio, 1989; Haines, Williams, Brain et al., 1995; Pattison & Kahan, 1983; Walsh & Rosen, 1988). Therefore, rather than implying an underlying psychopathology peculiar to persons who habitually cut their wrists,

it would be more appropriate to interpret wrist cutting as one form of a wider self-mutilative phenomenon. Clearly, a classification system incorporating a broader range of self-mutilative behaviours is required.

3.1.2 Behaviour-descriptive classification

Self-mutilation has been discussed in behaviour-descriptive terms (Ross & McKay, 1979). This approach identified nine categories of self-mutilative behaviour according to the method of injury utilised. In doing so, the authors aimed to illustrate the broad scope of self-mutilation. The behaviours outlined were skin cutting, biting, skin abrading, severing, inserting objects under the skin, skin burning, ingesting or inhaling poisonous substances, hitting and constricting (Ross & McKay, 1979).

Behaviour-descriptive information is useful in terms of understanding the occurrence of particular self-mutilative behaviours and providing ideas for the management of specific behaviours. However, research has demonstrated that individuals who self-mutilate often employ a range of self-mutilative behaviour (e.g., Favazza & Conterio, 1989). A behaviour-descriptive classification system does not take into account similarity between these behaviours in terms of motivations for self-mutilation or processes associated with the behaviours themselves. Certainly, the circumstances surrounding the self-mutilative act are likely to be similar for at least some of the behaviours described. From a

treatment perspective, it makes more sense to group these behaviours accordingly (Walsh & Rosen, 1988). In addition, a behaviour-descriptive approach to classification does not consider the level of psychological disturbance or distress at the time of the self-mutilative act, nor the subcultural context in which the behaviour occurred. Consideration of these factors is crucial to the choice of an effective treatment regime. Clearly a classification system that incorporates these aspects of self-mutilation would be more appropriate and enhance understanding and management of self-mutilative behaviour.

3.1.3 Deliberate self-harm syndrome

Morgan (1979) initially proposed separate classification of a deliberate self-harm syndrome (DSH). The term 'non-fatal deliberate self-harm' was intended to incorporate both failed suicide attempts and acts of deliberate self-harm that were not suicidal in intention (Morgan, 1979). The DSH syndrome included drug overdoses, self-poisoning with non-ingestants and other chemicals such as gas, as well as lacerations and other forms of physical self-injury (Morgan, 1979; Morgan, Burns-Cox, Pocock & Pottle, 1975). It was the authors' intention to derive a term that was general enough to incorporate all kinds of self-harming behaviour and one that was free from implied motive unlike terms such as attempted suicide that implies that self-harming behaviours are necessarily suicidal in nature (Morgan, Pocock & Pottle, 1975).

Although it was based on research which utilised a large sample, the proposition for a DSH syndrome had a number of severe limitations (Walsh & Rosen, 1988). The practical application of such a general term is extremely limited. For example, considering self-cutting and self-poisoning as part of a single DSH syndrome is problematic. Self-poisoning is an unpredictable and ambiguous behaviour in terms of the harm that it causes (Walsh & Rosen, 1988). For self-cutting, however, the harmful effects are immediately apparent. In addition, it is clearly inappropriate to include failed suicide attempts and highly lethal behaviours and low lethality behaviours such as laceration in a single clinical syndrome. As discussed in Chapter 2, these behaviours vastly differ in terms of lethality, repetition and intent. Indeed, combining suicide attempts and non-suicidal self-mutilative acts under the same umbrella of deliberate self-harm unnecessarily blurs the distinction between suicidal behaviour and self-mutilation (Walsh & Rosen, 1988) and does little to determine effective treatment programmes for these distinct clinical phenomena.

Later researchers modified Morgan's (1979) proposition and suggested that DSH involves "intent to produce physical self-harm, at a low level of lethality, in a repetitive pattern" (Kahan & Pattison, 1984, p.27). All cases involving apparently lethal intent, and individuals exhibiting psychosis, retardation and signs of personality disorders were excluded from this modified DSH syndrome (Kahan & Pattison, 1984; Pattison & Kahan, 1983). The authors claimed that

DSH did constitute an independent clinical syndrome, but that it also was appropriate to diagnose the DSH syndrome as secondary to other psychiatric disorders (Kahan & Pattison, 1984; Pattison & Kahan, 1983).

Clinical features of Pattison and Kahan's (1983) DSH syndrome included: (1) a sudden, irresistible impulse to harm oneself; (2) the psychological experience of an intolerable situation from which the person can neither escape nor control; (3) the experience of increasing anxiety, agitation, and anger in response to the perceived situation; and (4) constriction of perceptual and cognitive process resulting in a narrowed perspective of the situation and alternatives to action (Kahan & Pattison, 1984; Pattison & Kahan, 1983). These features depict the tension reducing qualities of self-mutilation that commonly have been reported (Brain et al., in press, 1998; Favazza & Conterio, 1989; Gardner & Gardner, 1975; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Haines, Williams, Brain et al., 1995; Herpertz, 1995; Lion & Conn, 1982; Pao, 1969; Rosenthal et al., 1972; Simpson, 1975, 1976; van Moffaert, 1990). Upon experiencing mounting and intolerable tension, self-mutilation is perceived as the only way to effectively reduce these unpleasant feelings (Graff & Mallin, 1967; Favazza & Conterio, 1989; Feldman, 1988; Pao 1969; Rosenthal et al., 1972; Simpson, 1975, 1976).

The DSH syndrome proposal (Kahan & Pattison, 1984; Pattison & Kahan, 1983) was particularly significant as it was the first classification system to specifically emphasise the value of

distinguishing between suicidal and nonsuicidal self-harm behaviours. Self-poisoning was included as deliberate self-harm in so far as suicidal intent was not evident (Kahan & Pattison, 1984). However, as described in Chapter 2, intent is often particularly difficult to establish in cases of self-poisoning (Walsh & Rosen, 1988).

The DSH syndrome proposal was based on a literature review of only 56 case histories (Pattison & Kahan, 1983). It has been suggested that a sample of this size does not provide enough scope to establish a new clinical syndrome (Walsh & Rosen, 1988). Indeed, researchers have advised against establishing new syndromes on the basis of results from small sample sizes (Clendenin & Murphy, 1971; Weissman, 1975). Nevertheless, the DSH syndrome proposal certainly constituted a valuable prototype model which others have since refined and renamed (Favazza, 1996).

In summary, although some of the classification systems outlined so far have been more appropriate than others in terms of the behaviours that have been considered self-mutilative, a range of problems with the categorisation of these behaviours as distinct clinical syndromes have been identified. A precise working definition of self-mutilation still requires clarification.

3.1.4 Physical self-alteration - the behavioural continuum

An alternative approach to the classification of self-mutilation has been established via consideration of a continuum of physical self-alteration (Walsh & Rosen, 1988). These authors effectively

distinguished behaviours that should be considered self-mutilative according to the related dimensions of (1) the severity of physical damage inflicted, (2) psychological state at the time of the act, and (3) social acceptability of the behaviour. They defined self-mutilation in terms of a behavioural continuum pertaining to the alteration of physical appearance. This continuum is illustrated in Table 2. Consideration of self-mutilation in terms of a behavioural continuum can aid the understanding of the specific dimensions that cause the behaviour to be viewed as dysfunctional (Walsh & Rosen, 1988).

Table 2.
Self-alteration of physical form: A continuum.

Type	Examples of behaviour	Degree of physical damage	Psychological state	Social acceptability
I	Ear piercing, nail biting, small or professionally applied tattoos	Superficial to mild	Benign	Acceptable in all or most social groups
II	Punk rock piercing, scars among 19th century Prussian students, ritualistic scarring among Polynesian and African clans, large tattoos among sailors and motor-cycle gangs	Mild to moderate	Benign to agitated	Acceptable sabre only within a specific subculture
III	Wrist and body cutting, inflicted cigarette burns, self-inflicted tattoos, wound excoriation	Mild to moderate	Psychic crisis	Generally self-unacceptable in all social groups, may be acceptable with a few like-minded peers

(table continues)

Table 2. *(continued)*

IV	Autocastration, self-enucleation, amputation	Severe	Psychotic decompen-sation	Entirely unacceptable with all peers and in all social groups

(Walsh & Rosen, 1988, p.7)

Walsh and Rosen (1988) did not consider Types I and II to be self-mutilative behaviours. Type II behaviours do entail more severe physical injury than the ear piercing and nail biting indicative of Type I. However, both Type I and II behaviours are considered beauty enhancing or symbolically meaningful within a specific subculture and, therefore, cannot be labelled self-mutilative (Walsh & Rosen, 1988).

Only Type III and IV behaviours are considered self-mutilative using this classification system (Walsh & Rosen, 1988). Although Type IV is categorised as self-mutilation, it involves the severe self-injury inflicted by individuals suffering from psychosis, responding to disordered thoughts and perceptions. Type III describes a particularly common clinical entity, and, unlike other forms of self-mutilation, pertains to low lethality, socially unacceptable self-mutilation performed in reaction to psychological crisis (Walsh & Rosen, 1988). Type III self-mutilative behaviour is the concern of the current investigation.

3.1.5 Categories of self-mutilation

Favazza and colleagues (1992, 1993, 1995) have proposed a more detailed categorisation of self-mutilative behaviour based on an extensive literature review as well as their own research (Favazza, 1989b; Favazza & Conterio, 1988, 1989; Favazza & Favazza, 1987). These authors categorised self-mutilative behaviour according to the degree of tissue damage inflicted and the pattern of behaviour (Favazza & Rosenthal, 1993). This system has incorporated the full spectrum of self-mutilation by considering two categories of self-mutilative behaviour, culturally sanctioned and deviant self-mutilation. Culturally sanctioned self-mutilation encompasses the Types I and II behaviours detailed by Walsh and Rosen (1988).

Three forms of deviant self-mutilation have been described. Major self-mutilation incorporates the severe and potentially lethal Type IV self-mutilative behaviours that have most often been associated with psychosis (Favazza, 1989b, 1992; Favazza & Rosenthal, 1993; Favazza & Simeon, 1995). The term stereotypical self-mutilation has been used to describe the repetitive, rhythmic types of behaviours (e.g., head banging, finger biting) that most often have been associated with mental retardation and various organic conditions (Favazza, 1992; Favazza & Rosenthal, 1993; Favazza & Simeon, 1995). Walsh and Rosen's (1988) classification system did not consider stereotypical self-mutilative behaviour.

Superficial to moderate self-mutilation incorporates Walsh and Rosen's Type III self-mutilative behaviours. Consideration of

three types of superficial to moderate self-mutilative behaviours, (compulsive, episodic and repetitive) (Favazza & Rosenthal, 1993; Favazza & Simeon, 1995) has extended the clinical relevance of this classification system.

The term compulsive self-mutilation has been used to describe habitual behaviours such as trichotillomania (hair pulling), onychophagia (nail biting), skin picking and skin scratching that typically occur many times daily. These behaviours have been reported as occurring automatically and without conscious intent. Trichotillomania has been classified as a disorder of impulse control because the behaviour occurs in response to an irresistible urge and results in gratification or relief of that urge (Favazza & Simeon, 1995).

It has been suggested that compulsive self-mutilation is not phenomenologically different to obsessive-compulsive behaviours (Favazza & Simeon, 1995). Research has investigated the psychophysiological processes associated with obsessive-compulsive behaviour (Haines et al., 1998). Results suggested that performance of compulsive rituals may serve to maintain the individual's anxiety at a manageable level, rather than to promote a dramatic change in the degree of anxious symptoms. Indeed, compulsive rituals have been reported to serve a neutralising function (Rachman & Hodgson, 1980). Minimal levels of anxiety have been associated with ritual completion and maximal anxiety levels have been associated with response prevention (Emmelkamp, Bouman & Scholing, 1992).

Research has supported the notion that compulsive self-mutilative behaviours such as severe nail biting also may serve to prevent anxiety from escalating in stressful situations and maintain it at a manageable level rather than promoting a dramatic reduction in tension in the same manner as has been reported to occur via behaviours such as skin cutting (Haines, Williams, Brain et al., 1995; Wells, Haines & Williams, in press). In this sense, compulsive self-mutilation may serve a similar function to the rituals performed by people with obsessive-compulsive disorder.

Some authors have noted the co-morbidity of obsessive-compulsive disorder and compulsive self-mutilative behaviours (Christenson & Crow, 1996; Lipinski, 1991; Stanley, Borden, Bell & Wagner, 1994) and have suggested that behaviours such as trichotillomania are best considered to be a form of obsessive-compulsive disorder (Lipinski, 1992). Others have argued that the features of these disorders are distinct enough to warrant separate diagnostic categories (Himle, Bordnick & Thyer, 1995; Jenike, 1990). Given that compulsive self-mutilation appears to have both compulsive and impulsive elements (Favazza & Simeon, 1995; Stein, Simeon, Cohen & Hollander, 1995) it is most appropriate that compulsive self-mutilative behaviours are considered as distinct from obsessive-compulsive disorder.

Episodic self-mutilation has incorporated the Type III self-mutilative behaviours outlined by Walsh and Rosen (1988) such as skin cutting, skin burning, wound excoriation, insertion of objects

under the skin (e.g., needles), bone breaking and self-hitting. These behaviours have been understood to represent a maladaptive coping strategy (Brain et al., in press, 1998; Haines, Williams, Brain et al., 1995; Solomon & Farrand, 1996; Walsh & Rosen, 1988) and have often been reported to provide rapid relief from a distressing emotional state (Favazza, 1989a). Epidemics of episodic self-mutilation have been reported in institutional settings (Ross & McKay, 1979).

The types of behaviours that have been incorporated under the term episodic self-mutilation also have been reported to occur repetitively (Favazza & Conterio, 1989; Favazza & Simeon, 1995; Langbehn & Pfohl, 1993; Walsh & Rosen, 1988). In fact, a repetitive self-mutilation syndrome has been proposed (Favazza, 1992; Favazza & Rosenthal, 1993; Favazza & Simeon, 1995). The elements of this syndrome are presented in Table 3.

Table 3.
Diagnostic criteria for repetitive self-mutilation syndrome.

1. Preoccupation with harming oneself physically.
2. Recurrent failure to resist impulses to harm oneself physically, resulting in the destruction or alteration of body tissue.
3. An increasing sense of tension immediately before the act of self-harm.
4. Gratification or a sense or relief when committing the act of self-harm.
5. The act of self-harm is not associated with conscious suicidal intent and is not in response to a delusion, hallucination, transsexual fixed ideas, or serious mental retardation.

(Favazza & Simeon, 1995, p.189)

For some individuals, self-mutilation may become a habitual response to distressing internal and external stimuli (Favazza & Simeon, 1995). Reports have indicated that the behaviour may persist for decades, interspersed with periods of other impulsive behaviours such as episodic alcohol and substance abuse, eating disorders or kleptomania (Favazza, 1992; Favazza & Rosenthal, 1993; Favazza & Simeon, 1995).

The distinction between compulsive and repetitive self-mutilation is not always clear (Favazza & Simeon, 1995). Repetitive self-mutilative behaviours may occur very frequently and it may not always be possible to identify a specific precipitant. In addition, some individuals have displayed multiple self-mutilative behaviours, both compulsive and repetitive (Favazza & Simeon, 1995). However, this classification system is the most inclusive and clinically relevant to date. The structure of this system allows clear identification of problem behaviours and is diverse enough to account for individual differences between people who engage in self-mutilative behaviour.

3.1.6 Summary

A number of authors have attempted to classify self-mutilation. The practicality of these classification systems vary. Clearly, it is inappropriate to classify self-mutilation according to specific behaviours (e.g., wrist cutting). Reports have indicated that there are a range of self-mutilative behaviours that are similar in terms of their phenomenology and function (Favazza & Conterio,

1989). For example, the tension reducing aspects of a variety of superficial to moderate self-mutilative behaviours consistently have been noted (Favazza & Simeon, 1995; Gardner & Gardner, 1975; Haines, Williams, Brain et al., 1995; Pattison & Kahan, 1983; Simeon et al., 1992).

Currently, the most useful classification system categorises self-mutilation according to the degree of physical damage inflicted and the pattern of behaviour (Favazza, 1992; Favazza & Rosenthal, 1993; Favazza & Simeon, 1995). Following this classification system, superficial to moderate self-mutilation, in particular episodic and repetitive behaviours, are the concern of the present investigation. The authors have acknowledged that as a phenomenological classification system, it is subject to change according to increased knowledge regarding the processes of self-mutilative behaviour, particularly the biological markers and mechanisms of self-mutilation (Favazza & Rosenthal, 1993). Indeed, the aim of the present investigation is to contribute to the understanding of the mechanisms of self-mutilative behaviour. However, before any given behaviour can be researched effectively, clarification of a definition of the behaviour in question is required.

3.2 DEFINITION

A range of terms have been used to describe self-mutilative behaviour. As outlined in Chapter 2, terms such as parasuicide and attempted suicide have limited application due to the lack of

distinction they indicate between self-mutilative and suicidal behaviours. The importance of excluding acts of clear suicidal intent and including low lethality forms of self-injury in any working definition of self-mutilation has been emphasised (Favazza & Rosenthal, 1993; Pattison & Kahan, 1983; Ross & McKay, 1979; Walsh & Rosen, 1988). In addition, reports have indicated that the social unacceptability of the act and the use of multiple self-injurious methods are important defining characteristics of self-mutilative behaviour (Favazza & Conterio, 1989; Kahan & Pattison, 1984; Pattison & Kahan, 1983; Walsh & Rosen, 1988). These features have some utility in distinguishing self-mutilative behaviour from that which is suicidal.

Terms such as self-harm and self-wounding have been employed to describe superficial to moderate self-mutilative behaviours to avoid the connotation that the injury inflicted is disfiguring or grotesque (Rosen & Heard, 1995; Tantam & Whittaker, 1992). The term self-mutilation has been the most widely utilised to describe these behaviours and has been adopted in this investigation.

The term self-mutilation implies that the injury is self-inflicted. However, researchers have noted that a small proportion of individuals coerce others to inflict injury upon them. In one study, 12% of 240 females reported that they had let other people (excluding physicians) mutilate them, 9% said they had tricked dentists or physicians into performing unnecessary surgery, and 4% admitted to mutilating someone else (with permission) (Favazza &

Conterio, 1989). In light of this information, self-mutilation is more appropriately defined as 'deliberately inflicted' rather than 'self-inflicted' injury.

For the purposes of the present investigation self-mutilation has been defined as, 'deliberately inflicted and often repetitive, generally low lethality self-injurious behaviour, of a socially unacceptable nature, performed in the absence of conscious suicidal intent'. The following chapter describes the range of behaviours that are considered self-mutilative using this definition.

CHAPTER 4

TYPES OF SELF-MUTILATIVE BEHAVIOUR

A range of low lethality self-mutilative behaviours that are performed without conscious suicidal intent has been described. Regardless of whether these self-mutilative acts have been classed as compulsive behaviours or whether they have been performed episodically or repetitively, all have been associated with the relief of anxiety and tension with the commission of the act (Brain et al., in press; Favazza, 1992; Favazza & Rosenthal, 1993; Gardner & Gardner, 1975; Haines, Williams, Brain et al., 1995; Pattison & Kahan, 1983; Simeon et al., 1992; Solomon & Farrand, 1996). This tension reducing aspect of self-mutilation is discussed in detail in later chapters. The description of the behaviours that have been associated with this phenomenon that follows is by no means exhaustive, but it does illustrate the nature and extent of the more common types of superficial to moderate self-mutilative behaviours.

4.1 Skin cutting

Skin cutting has been one of the most commonly reported self-mutilative behaviours (Feldman, 1988; Fruensgaard & Flindt Hansen, 1988; Ross & McKay, 1979). The term skin cutting has been used to encompass a variety of behaviours including skin carving (Rosenthal et al., 1972; Schwartz et al., 1989), skin scratching and self-stabbing (Favazza, 1989a; Ross & McKay, 1979). Individuals have carved words or symbols into their skin that sometimes have resulted in quite serious scarring (Favazza & Conterio, 1989; Schwartz et al., 1989). In addition, quite substantial lesions have been produced

by repetitive scratching with fingernails (Gupta, Gupta & Haberman, 1986). Using the term skin cutting these behaviours have been integrated under a single category that is distinct from actions such as skin abrading and insertion of foreign objects under the skin (Ross & McKay, 1979).

The severity of injury inflicted by skin cutting has varied from light, superficial incisions associated with minimal bleeding to severe lacerations where nerves and tendons have been severed (Favazza & Conterio, 1989; Harris & Rai, 1976; Raine, 1982; Rosenthal et al., 1972; Takeuchi et al., 1986). People also have engaged in venesection and have stabbed themselves (Patel & de Moore, 1994). Skin cutting is typically performed in the absence of pain even though attempts to desensitise or anaesthetise the skin prior to cutting rarely have been reported (Favazza & Conterio, 1989; Feldman, 1988; Ross & McKay, 1979; Walsh & Rosen, 1988). This aspect of self-mutilation is discussed in more detail in Chapter 6.

Reports have indicated that the majority of people who cut themselves engage in superficial to moderate self-injury that has little risk of death (Favazza, 1989a; Ross & McKay, 1979; Simpson, 1976). As described in Chapter 3, wrist cutting often has been interpreted as a suicide attempt or suicidal gesture. However, the lethality of this behaviour is commonly low (Walsh & Rosen, 1988). A study of completed suicide in Tasmania over a twenty year period has demonstrated that only 15 deaths were attributed to self-cutting out of a total of 1,051 suicides (1.4%). These deaths typically occurred

as a result of cutting of the carotid artery (Haines, Hart, Davidson, Slaghuis & Williams, 1989). Lethal self-inflicted knife wounds most commonly have been the result of self-stabbing (Vanezis & West, 1983) although not all self-inflicted stab wounds have been associated with high levels of suicidal intent (Patel & de Moore, 1994).

The wrist and forearm have been the most commonly reported sites of self-cutting although these have not been exclusive sites of injury (Feldman, 1988; Gardner & Gardner, 1975; Lion & Conn, 1982; Novotny, 1972; Schwartz et al., 1989; Simpson, 1976). However, as noted in Chapter 3, almost every part of the body has been subjected to self-cutting (Rosenthal et al., 1972; Ross & McKay, 1979; Simpson, 1976; Takeuchi et al., 1986). Individuals have cut their legs (Feldman, 1988; Novotny, 1972; Rosenthal et al., 1972; Takeuchi et al., 1986), feet (Feldman, 1988), abdomen and stomach (Novotny, 1972; Rosenthal et al., 1972), face (Feldman, 1988; Novotny, 1972; Raine, 1982; Rosenthal et al., 1972; Schwartz et al., 1989), hands (Feldman, 1988; Rosenthal et al., 1972); neck (Novotny, 1972; Rosenthal et al., 1972; Schwartz et al., 1989) and chest or breasts (Feldman, 1988; Muluka & Dhadphale, 1986; Rosenthal et al., 1972; Schwartz et al., 1989). Selection of the bodily area for self-cutting appears to have been limited only by the dexterity of the individual engaging in the behaviour (Ross & McKay, 1979).

Multiple sites of injury have been reported (Rosenthal et al., 1972). Individuals have changed the site of injury with subsequent self-cutting episodes. Although only a single laceration may be

inflicted, multiple wounds more commonly have been reported in a single cutting episode. These wounds have ranged from quite superficial scratching that typically heals without scarring to more substantial injury (Simpson, 1976).

The razor blade has been the most frequently used instrument for self-cutting (Feldman, 1988; Harris & Rai, 1976; Novotny, 1972; Raine, 1982; Rosenthal et al., 1972; Schwartz et al., 1989; Takeuchi et al., 1986) although a range of tools have been used to cut the skin. Individuals have utilised knives (Harris & Rai, 1976; Takeuchi et al., 1986) including plastic knives (Rosenthal et al., 1972), scissors (Takeuchi et al., 1986; Tantam & Whittaker, 1992), pins (Rosenthal et al., 1972; Takeuchi et al., 1986), broken glass (Novotny, 1972; Rosenthal et al., 1972; Schwartz et al., 1989; Simpson, 1976), and fingernails (Schwartz et al., 1989) to cut themselves. Desperate individuals intent on self-infliction of injury have modified instruments such as spoons (Johnson & Britt, 1967), food bones (Feldman, 1988), phonograph records (Rosenthal et al., 1972) and have even sawn the skin with strands of hair to draw blood (Ross & McKay, 1979). Indeed, the range of instruments used to inflict injury is a testimony to the resourcefulness of individuals who self-mutilate (Feldman, 1988; Tantam & Whittaker, 1992).

4.2 Abrasion

Even when individuals have been isolated and had all potential instruments for self-mutilation removed, they have

demonstrated a remarkable capacity for inflicting injury upon themselves (Ross & McKay, 1989). Abrasive wounds have been achieved by rubbing parts of the body against solid objects or against other parts of the body (Fruensgaard & Flindt Hansen, 1988). Continual irritation of the skin by the mouth, licking and sucking, has led to open wounds. There also have been reports of shattered glass being rubbed into the skin to inflict injury (Rosenthal et al., 1972; Tantam & Whittaker, 1992). Abrasive injuries can be quite severe although these types of injuries have been infrequently reported in the literature (Gupta, Gupta & Haberman, 1987).

4.3 Insertion

Insertion of foreign objects under the skin has been documented. In particular, needles, pins, glass and paper clips have most commonly been inserted under the skin. A range of other objects also have been utilised for insertion (Ross & McKay, 1979).

Reports have indicated that most forms of self-mutilation are carried out impulsively (Favazza, 1992; Favazza & Simeon, 1995). This has typically not been the case for insertion of objects under the skin. Instead, careful planning and slow execution of the act of insertion has been reported (Ross & McKay, 1979). One review provided the example of a prisoner who carefully sewed buttons onto his body (Yaroshevsky, 1975). Of course, instances of impulsive insertion have not been unknown (Ross & McKay, 1979).

4.4 Self-biting

Nail biting has been a commonly reported form of self-biting (Azrin & Nunn, 1973; Silber & Haynes, 1992). However, as mentioned in Chapter 3, it is not appropriate to categorise all instances of nail biting as self-mutilative (Walsh & Rosen, 1988). Only severe biting of the nail where blood is drawn, resulting in significant damage to the cuticles and nail bed has been considered self-mutilative (Wells, Haines, Williams et al., in press). Reports have indicated that severe onychophagia can cause serious damage and permanent disfigurement (Leonard, Lenane, Swedo, Rettew & Rapoport, 1991; Ross & McKay, 1979).

There have been instances of individuals causing damage to the lips, tongue and inside of the mouth by self-biting. In addition, individuals have caused tissue and skin damage by biting their arms, hands and fingers (Ross & McKay, 1979).

4.5 Skin burning

Self-inflicted burns have been a commonly reported method of self-mutilation (Favazza, 1989a; Fruensgaard & Flindt Hansen, 1988; Rosenthal et al., 1972; Ross & McKay, 1979; Schwartz et al., 1989). As with skin cutting, most areas of the body have been subjected to injury from self-inflicted burns (Ross & McKay, 1979). Superficial injuries most commonly have been reported as a result of self-burning (Ross & McKay, 1979). Total self-immolation is a rare and

lethal phenomenon (O'Sullivan & Kelleher, 1989; Ross & McKay, 1979).

Individuals most commonly have burned themselves with lighted cigarettes, matches and lighters (Raine, 1982; Rosenthal et al., 1972). A range of other methods of inflicting burns including sitting on hot radiators, burning with irons and hotplates, electric shock, drinking boiling fluid, applying caustic substances to open lacerations and applying nitric acid to the skin also have been noted (Ross & McKay, 1979; Tantam & Whittaker, 1992).

Reports have indicated that skin-burning often is performed quickly and impulsively. This makes it a convenient method of self-mutilation. The disadvantage for the self-burning individual has been that the injury that results from burning may be out of proportion to the intent initially associated with the act. Burning is not necessarily easily controlled by the individual. Incidents where clothing has been ignited and flammable liquid has been spilled leading to severe burns or death have been reported (Ross & McKay, 1979).

As noted, the majority of people who self-mutilate injure themselves by cutting. Self-burning often has been reported as a secondary method of self-mutilation. In one study, half of the sample of females who carved their skin reported that they had also engaged in skin burning (Schwartz et al., 1989). Indeed, many individuals who self-mutilate have reported engaging in more than one type of self-injurious behaviour (Rosenthal et al., 1972).

4.6 Hitting

Individuals have hit parts of their body against solid objects (e.g., head banging against a wall, punching walls or windows), hit themselves with solid objects (e.g., hitting oneself with a bat or hammer) and have hit parts of their body with another part of the body (e.g., self-kicking, punching the head or body with a closed fist) to inflict injury (Langbehn & Pfohl, 1993; Tantam & Whittaker, 1992). These behaviours can cause considerable bodily injury (Fruensgaard & Flindt Hansen, 1988; Ross & McKay, 1979).

It has been suggested that the nature of the injury caused by self-hitting is different from that inflicted by other forms of self-mutilation such as cutting or burning. Injury inflicted by hitting may not be as apparent or as abhorrent to an observer as the injuries that result from self-cutting or burning (Ross & McKay, 1979) although this is not always the case. For example, punching windows causing glass to break has been a commonly reported behaviour that results in cuts and lacerations (McKerracher, Loughnane & Watson, 1968). In addition, individuals have engaged in self-hitting to the extent that bones have been broken (Feldman, 1988).

There have been reports of individuals injuring themselves by failing to protect the body when falling (Tantam & Whittaker, 1992). In addition, individuals have deliberately fallen from heights specifically selected so that the fall was more likely to result in injury rather than death (Ross & McKay, 1979). Cases of self-choking in the absence of suicidal intent also have been described. In these cases the

behaviour was distinguished from erotic or sexual asphyxiation (Colon, Popkin & Carlson, 1989). The factor that all hitting behaviours have in common is that bodily injury can be effected in the absence of any instrument that commonly has been associated with self-mutilation.

4.7 Skin picking and wound excoriation

Compulsive self-mutilative behaviours such as skin picking and scratching have received little research attention. However, reports have indicated that skin picking is a common and potentially disfiguring problem (Favazza & Simeon, 1995). In particular, acne excoriation has been identified where the individual picks at acne and spreads the condition (Kent & Drummond, 1989). Reports have indicated that neurotic excoriations are more commonly encountered by dermatologists than psychiatrists (Favazza & Simeon, 1995; Gupta et al., 1986).

There also have been reports of individuals interfering with the healing of wounds and disturbing the medical treatment applied by physicians to wounds (Favazza & Simeon, 1995). Subsumed under this category have been mild behaviours such as picking at scabs (Schwartz et al., 1989) as well as behaviours that result in more serious injury such as pulling out stitches and refracturing limbs (Rosenthal et al., 1972).

4.8 Summary

This review of the types of behaviours that have been considered self-mutilative according to the definition outlined in Chapter 3 is by no means exhaustive. A variety of behaviours have been incorporated under the term 'self-mutilation', the most common of which is skin cutting. Research has demonstrated that many individuals engage in a combination of behaviours during their period of self-mutilation. Whereas a particular behaviour (usually skin cutting) may be predominant, often other methods also are employed (Favazza & Conterio, 1989; Herpertz, 1995; Walsh & Rosen, 1988).

The lack of an instrument has not dissuaded the individual intent on self-mutilating. In the absence of cutting or burning tools individuals have demonstrated their resourcefulness and motivation to self-mutilate by engaging in behaviours such as self-biting, self-hitting and falling, skin picking and wound excoriation.

The severity of injury inflicted through self-mutilation may be mild, moderate or severe. This generally has been unrelated to the type of self-mutilative behaviour, although with some behaviours (e.g., self-burning) it is more difficult to control the degree of damage inflicted and severe injury may occur by accident. In addition, as outlined in Chapter 3, as self-mutilative behaviour becomes habitual the risk of serious injury or accidental death increases. An increased understanding of the characteristics of individuals who self-mutilate, their motivations for engaging in the behaviour, and the

reinforcement mechanisms of self-mutilation would aid in identifying individuals who are at risk for developing a repetitive behavioural pattern. The present investigation aims to address each of these factors in turn.

In order to ensure that subsequent results were generalisable to a broader population of people who self-mutilate it initially was necessary to determine whether the nature and extent of the self-mutilative behaviour of the present sample was consistent with that which previously has been reported. The study reported in the following chapter addresses this issue.

5.1 INTRODUCTION

The range of behaviours that constitute superficial or moderate self-mutilation do represent a significant clinical problem (Favazza & Rosenthal, 1993; Walsh & Rosen, 1988). This form of self-mutilation has been observed as a symptom of a variety of psychiatric disorders (Favazza & Rosenthal, 1993; Siomopoulos, 1974; Simpson, 1975; Takeuchi et al., 1986), in prisons and other institutional settings (Feldman, 1988; Ross & McKay, 1979; Simpson, 1976; Winchel & Stanley, 1991) and has been reported in persons representing every decade from the second to the seventh (Clendenin & Murphy, 1971). Therefore, a variety of disciplines from medical and psychiatric to corrective services have been confronted with the behaviour. Yet none have developed fully effective methods for managing self-mutilation (Feldman, 1988; Raine, 1982; Simpson, 1976; Thorburn, 1984).

To date, self-mutilation related research has devoted considerable attention to the description of characteristics of people who self-mutilate and the nature and extent of their self-mutilative behaviour (e.g., Favazza & Conterio, 1988, 1989; Gardner & Gardner, 1975; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Pao, 1969; Rosenthal et al., 1972; Simpson, 1975; 1976). In particular, early researchers devoted considerable attention to the development of a profile of individuals who cut their wrists (Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Pao, 1969; Rosenthal et al., 1972). This description of a young woman who repeatedly engages in superficial

or moderate self-cutting and experiences relief upon commission of the act is very similar to the profile that has been generated in more recent research efforts (Favazza & Conterio, 1989). This research has significantly contributed to the understanding of self-mutilation and the risk factors associated with the development of the behaviour. The following section details the common characteristics of individuals who engage in self-mutilation and the nature and extent of their self-mutilative behaviour.

5.1.1 Sex

It generally has been accepted that the majority of people who exhibit repetitive self-mutilation are female (Carroll, Schaffer, Spensley & Abramowitz, 1980; Favazza & Conterio, 1989; Langbehn & Pfohl, 1993; Lion & Conn, 1982; Novotny, 1972; Pao, 1969; Rosenthal et al., 1972; Simpson, 1975; Tantam & Whittaker, 1992). Nevertheless, there have been reports that have focused exclusively on the self-mutilative behaviour of males (e.g., Bach-y-Rita, 1974; Haines, Williams, Brain et al., 1995; Kaplan & Fik, 1977).

The impression of a female predominance with regard to self-mutilation may have been the result of a sampling bias. Most self-mutilation related research has been conducted using inpatient populations, most commonly in private hospital settings, where, it has been suggested, females who self-mutilate are more likely to be admitted (Clendenin & Murphy, 1971; Weissman, 1975). One large study recruited 250 self-mutilation participants by advertising on a

day time television chat show (Favazza & Conterio, 1988). Of this sample, 96% were female. The authors noted that this female predominance more likely reflected the nature of participant recruitment than the actual gender ratio of people who self-mutilate. Researchers have suggested that males who self-mutilate are more likely to enter the public health or criminal justice systems (Clendenin & Murphy, 1971). It has been noted that the greatest concentration of males who self-mutilate are found in prisons where the syndrome is usually endemic (Favazza, 1992).

Research has demonstrated that a significant proportion of individuals who self-mutilate are male (Clendenin & Murphy, 1971; Maloney et al., 1987; Weissman, 1975). In large community samples, 40-57% of self-mutilation participants recruited were male (Clendenin & Murphy, 1971; Weissman, 1975). However, these studies examined isolated incidents of skin cutting that were considered suicide attempts and were severe enough to require a police report or hospital treatment (Favazza & Rosenthal, 1993).

The self-mutilation inflicted by females has been considered to be phenomenologically different from the self-mutilative behaviour of males (Gardner & Gardner, 1975; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Rosenthal et al., 1972). In terms of skin cutting, early research suggested that males were more likely to exhibit single episodes of severe laceration indicative of a suicide attempt and that females were more likely to engage in repetitive, delicate skin cutting (Pao, 1969). In addition, males who self-mutilate have been excluded

from investigations of self-mutilative behaviour or their results have not been reported on the basis that they have been considered atypical (e.g., Favazza & Conterio, 1989; Graff & Mallin, 1967; Herpertz, 1995; Langbehn & Pfohl, 1993; Rosenthal et al., 1972).

However, in one sample of individuals presenting for emergency treatment of self-inflicted injuries, the majority of participants were unemployed males who were under the age of 35 years and had superficially cut their wrists and forearms (Maloney et al., 1987). The authors suggested their results demonstrated that the traditional self-mutilation profile was based on a sampling bias and that the typical self-cutting individual is a young, unemployed male.

There seems to be no readily apparent reason why self-mutilation would be a behaviour predominantly carried out by females or males. It has been suggested that the traditional impression of a high proportion of females engaging in self-mutilation is the result of a sampling artefact. Clinical impressions have indicated females are most likely to represent about two thirds of individuals who self-mutilate (Favazza & Conterio, 1989).

5.1.2 Age

Whether male or female, research has indicated that individuals who engage in self-mutilative behaviour generally are young (Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Kaplan & Fik, 1977; Pattison & Kahan, 1983; Simpson, 1975, 1976). It has been noted that most people who self-mutilate are under 30 years of age

(Favazza & Conterio, 1989; Herpertz, 1995; Rosenthal et al., 1972; Simpson, 1976). The average age of participants in clinical studies consistently has been between 22 and 28 years (Carroll et al., 1980; Gardner & Gardner, 1975; Graff & Mallin, 1967; Favazza & Conterio, 1989; Pattison & Kahan, 1983; Rosenthal et al., 1972). One study indicated a peak age range for self-mutilation of between 18 and 24 years (Herpertz, 1995).

Nevertheless, self-mutilative behaviour is not exclusively the domain of the young (Simeon et al., 1992). Self-mutilation has been reported in individuals representing every decade from the second to the seventh (Ballinger, 1971; Clendenin & Murphy, 1971; Favazza & Conterio, 1989).

The onset of self-mutilation has been reported typically to occur in adolescence (Kahan & Pattison, 1984; Pattison & Kahan, 1983). The mean age for reported onset of self-mutilative behaviour has ranged from 13 (Pao, 1969) to 24 years (Gardner & Gardner, 1975). However, later onset of self-mutilative behaviour has been noted with first self-mutilative episodes reported as occurring up to 38 (Graff & Mallin, 1967) and 56 years (Gardner & Gardner, 1975).

5.1.3 Nature and extent of self-mutilation

Research has indicated that the majority of individuals who self-mutilate utilise multiple methods of injury (Favazza & Conterio, 1989; Herpertz, 1995; Walsh & Rosen, 1988). As mentioned self-mutilating individuals most commonly engage in skin cutting and

utilise behaviours such as skin burning, self-hitting, wound excoriation, severe skin scratching, biting, trichotillomania, and bone breaking to a lesser extent (Favazza & Conterio, 1989; Herpertz, 1995; Langbehn & Pfohl, 1993).

As described in Chapter 4, the arm has been identified as the most common site for self-mutilation. To a lesser extent, individuals also have reported mutilating their legs, abdomen, head, chest and genitals (Favazza & Conterio, 1989; Langbehn & Pfohl, 1993).

Half of one large sample reported that they had self-mutilated on more than 50 occasions, 23% of participants estimated they had mutilated themselves 25 to 50 times. Only 2% of participants reported a single episode of self-mutilation (Favazza & Conterio, 1989). It has been suggested that the method of sampling for this research (by television advertising) may have attracted the particular interest of individuals for whom self-mutilation represented a chronic problem and biased the results (Tantam & Whittaker, 1992). However, a repetitive pattern of self-mutilative behaviour has been noted by other researchers (Gardner & Gardner, 1975; Graff & Mallin, 1967; Kahan & Pattison, 1984; Ross & McKay, 1979; Walsh & Rosen, 1988). Eighty-one percent of one sample of 38 self-mutilation participants reported that they had engaged in five or more episodes of self-mutilation. Only 2 participants reported a single episode of self-mutilation (Langbehn & Pfohl, 1993).

As described in Chapter 3, a repetitive self-mutilation syndrome has been proposed (Favazza, 1992; Favazza & Rosenthal,

1993) and the characteristics of individuals who repeatedly self-mutilate have been well documented (Favazza & Conterio, 1989; Favazza & Simeon, 1995; Walsh & Rosen, 1988). However, there has been little consideration as to how this behaviour develops from episodic acts of self-mutilation to a habitual behaviour pattern.

One study has specifically considered factors associated with repetitive self-mutilation (Dulit et al., 1994). A group of people who frequently self-mutilated were compared with participants who had engaged in the behaviour infrequently (i.e., less than 5 lifetime episodes). Individuals who frequently self-mutilated reported higher levels of suicidal ideation, were more likely to have attempted suicide, and had a history of more psychiatric hospitalisations and longer inpatient and outpatient treatment than the infrequent self-mutilation group (Dulit et al., 1994). This research has indicated that individuals who repetitively self-mutilate are more distressed and have more severe and chronic psychological problems than individuals who engage in only a few episodes of the behaviour.

The course of repetitive self-mutilation has been reported to be variable with the behaviour losing its intensity after 10 to 15 years (Favazza, 1992). In one study, the mean duration of self-mutilative behaviour was 5 years (Gardner & Gardner, 1975). One participant reported having engaged in the behaviour for 26 years. In another study, 7 of 20 participants reported that they had been engaging in the behaviour for more than 10 years (Roy, 1978). One participant reported a 27 year history of self-mutilation. These results have

provided support for the proposition that for some individuals self-mutilation may represent a life long coping mechanism. Even after long periods of quiescence the behaviour may re-emerge during periods of emotional turmoil (Favazza, 1992).

5.1.4 Patterns of help seeking behaviour

To some extent, the chronic nature of self-mutilation is reflected in the degree of contact with mental health services reported by some individuals who engage in the behaviour. One study comparing a self-mutilation group (n = 38) with a group of 88 people who had attempted suicide demonstrated that self-mutilation participants were more likely to have had previous treatment from a mental health care professional and were more likely to have had 3 or more psychiatric admissions to hospital (Langbehn & Pfohl, 1993). The self-mutilation group had a significantly longer history of contact with mental health professionals (11 years) than the group who had attempted suicide (4 years).

However, other researchers have noted that many individuals who self-mutilate do not seek medical treatment or report their self-mutilative behaviour, rather they treat their wounds themselves (Favazza & Conterio, 1989; Simpson, 1976). In addition, a substantial proportion of self-mutilation participants in one study who had sought psychiatric help reported that their treatment experiences were profoundly unhelpful and resulted in a reluctance to engage in further help seeking behaviour (Johnson, 1997). This has

highlighted the importance of accurate identification of the treatment needs of individuals who self-mutilate.

In one large study, 42% of the 240 female participants reported that someone, usually the mother or a friend, was aware of the first self-mutilative episode (Favazza & Conterio, 1989). However, only 8% of participants sought professional help within a week of this initial episode. Substantially more participants (37%) did not seek professional help for more than one year following the onset of the behaviour and 39% reported that they had never sought help for managing their self-mutilation.

Individuals who seek treatment for self-inflicted injuries may not admit to self-mutilation (Feldman, 1988; Simpson, 1976). The negative reaction of medical staff and the stigma associated with self-mutilation may encourage the individual to mislead professionals regarding the cause of self-inflicted injuries (Favazza, 1989a; Solomon & Farrand, 1996; Walsh & Rosen, 1988). Indeed, a number of authors have noted the fear, anger and anxiety reported by care-givers and fellow hospital inpatients that is often provoked by individuals who self-mutilate (e.g., Favazza, 1996; Grunebaum & Klerman, 1967; Nelson & Grunebaum, 1971; Podvoll, 1969).

5.1.5 Suicidal behaviour

Reports have indicated that a proportion of individuals who self-mutilate also engage in suicidal behaviour (Favazza & Conterio, 1989; Herpertz, 1995; Langbehn & Pfohl, 1993; Rosenthal et al., 1972;

Schwartz et al., 1989). It has been suggested that these suicide attempts reflect the desperation of individuals who habitually self-mutilate to control their self-mutilative behaviour (Favazza, 1992; Favazza & Conterio, 1989). However, suicidal behaviour has been reported to occur both prior to the onset of self-mutilative behaviour (Schwartz et al., 1989) and pre- and post- treatment for self-mutilation (Fruensgaard & Flindt Hansen, 1988).

Although not identified as a suicidal act, suicidal ideation has been reported by some individuals who self-mutilate (Dulit et al., 1994; Pattison & Kahan, 1983). One review indicated that 13-41% of self-mutilation participants in various studies had reported suicidal ideation associated with self-mutilative episodes (Walsh & Rosen, 1988). In addition, higher levels of suicidal ideation have been associated with a high frequency of self-mutilative behaviour (Dulit et al., 1994).

As described in Chapter 2, when attempting suicide, individuals who self-mutilate typically use a different method, most commonly self-poisoning (Favazza, 1992; Schwartz et al., 1989). In one study, 37% of self-mutilating participants described a history of suicide attempts (Herpertz, 1995). In another, 78% of female self-mutilation participants described past suicide attempts most commonly by self-poisoning (86%) and skin cutting (42%) (Langbehn & Pfohl, 1993). This group reported a history of significantly more suicide attempts than a group of people who were admitted to hospital for attempted suicide and had no history of self-mutilative

behaviour. Thirty two percent of the self-mutilation group reported five or more suicide attempts. The suicide attempts of the self-mutilation group were judged to be of significantly lower lethality than the attempts made by the suicide attempt group (Langbehn & Pfohl, 1993).

As suggested in Chapter 2, it may be that for some individuals behaviours such as self-poisoning represent an extension of their self-mutilative behaviour rather than an authentic suicide attempt. Comparative research regarding the factors associated with the occurrence and maintenance of self-mutilative and so-called suicidal behaviours would clarify this notion.

5.1.6 Summary

The literature has indicated a number of characteristics that individuals who engage in superficial to moderate self-mutilation have in common. The typical self-mutilating individual has most recently been described as female, under 30 years of age, who usually cuts herself but also engages in other methods of self-mutilation (Favazza & Conterio, 1989). She may exhibit suicidal behaviour, most commonly self-poisoning (Favazza, 1992). Generally, self-mutilative behaviour originates during the early teenage years, may wax and wane for many years, and has been reported to lose its intensity after 10 to 15 years (Favazza & Rosenthal, 1993).

Most of the research from which the traditional self-mutilation profile has been derived was conducted using inpatient

and institutionalised populations, individuals who referred themselves for help, or individuals whose injuries have been severe enough to warrant medical attention. However, it is evident that there is a substantial proportion of people who engage in self-mutilative behaviour and do not come into contact with mental health services. In one sample of 500 American college students, 14% reported at least one episode of self-mutilation (Favazza, DeRosear & Conterio, 1989). The factors associated with self-mutilation in nonpatient and noninstitutionalised populations, particularly with regard to males who engage in the behaviour require clarification.

5.1.7 Aims and hypotheses

The research conducted to date has contributed a great deal to the understanding of the risk factors for self-mutilation, the characteristics of individuals who self-mutilate and the nature and extent of their self-mutilative behaviour. In order to develop effective methods of treatment it is also necessary to identify factors associated with the development and maintenance of the behaviour itself. Prior to embarking on an investigation regarding factors associated with self-mutilation it was important to determine whether the characteristics of the present sample and the nature and extent of their self-mutilative behaviour was consistent with previous reports. This was the aim of the present study.

The characteristics of a non-inpatient self-mutilation sample were examined in order to determine whether the traditional profile

of an individual who engages in self-mutilation is generalisable to a broader population of people who self-mutilate. It was hypothesised that the greater proportion of participants recruited from the community would be female and under 30 years of age, that superficial to moderate skin cutting would be the most commonly reported method of self-mutilation, that other methods would be reported to a lesser extent, and that for most individuals these behaviours would be repetitive. Further, it was hypothesised that over half of the participants would report at least one previous suicide attempt, most commonly by self-poisoning. Little evidence of help seeking behaviour was expected in this largely self-referred self-mutilation sample.

As mentioned, the fact that the majority of participants that have been the focus of self-mutilation research have been female may have resulted from a sampling bias. However, there has been some suggestion that the self-mutilative behaviour of males and females is phenomenologically different (Gardner & Gardner, 1975; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Rosenthal et al., 1972). Yet there have been no systematic comparisons between the self-mutilative behaviour of males and females to verify this notion. In the present study, no significant differences in the nature and extent of self-mutilative behaviour between male and female participants were expected. However, it was anticipated that females would report a more extensive history of help seeking behaviour than males.

Subsequent studies in this investigation consider factors that contribute to the cessation of self-mutilative behaviour. It was necessary to determine that any significant effects demonstrated in the following studies were not attributable to differences in the nature and extent of the behaviour under consideration. Therefore, in the present study the history of self-mutilative behaviour reported by individuals who were currently engaging in the behaviour was compared with a group who had 'recovered' from the symptom of self-mutilation. No significant differences in the nature and extent of self-mutilative behaviour reported by current and recovered self-mutilation participants were predicted.

As mentioned, there have been few systematic comparisons of the characteristics of individuals who self-mutilate frequently and those who have engaged in only a few episodes of self-mutilation. An examination of the suicidal behaviour, suicidal ideation and help seeking behaviour of frequent and infrequent self-mutilation groups was made in the present study to determine whether these factors alter as self-mutilative behaviour becomes habitual. On the basis of previous research, it was anticipated that individuals who frequently self-mutilate would report higher levels of suicidal ideation and may report a greater frequency of suicidal and help seeking behaviours.

5.2 METHOD

5.2.1 Participants

Nineteen males and 27 females with a history of self-mutilative behaviour participated in this investigation. Of this sample, 87% of participants were self-referred and had responded to internal advertisement of this research at the University of Tasmania. Other participants were recruited from community mental health clinics (8.7%) and private psychological practice (4.4%) and were referred to the investigator by their treating clinician.

Self-mutilation participants and a control group recruited from the University undergraduate population also completed subsequent experiments. Each study was concerned with the individuals' present functioning. To ensure that data obtained for each study was consistent with that level of functioning involvement in this investigation was complete within a 3 week period. As there is evidence to suggest that between periods of self-mutilative behaviour individuals function normally (Walsh & Rosen, 1988) a longer duration between studies would have had implications for results.

For the purposes of data analysis, the total sample of 46 participants were classified according to whether they had self-mutilated within the 6 months prior to interview (current self-mutilation, n = 21) or whether they had not engaged in the behaviour for a period of more than 6 months prior to participation in this investigation (recovered self-mutilation, n = 25).

In addition, participants were categorised as engaging in frequent or infrequent self-mutilation according to frequency of skin cutting behaviour. Only individuals who engaged in skin cutting were included in this analysis to ensure that the severity of the behaviour considered was comparable. Forty-three participants reported that they had cut themselves. Of those participants, 29 were categorised as having frequently self-mutilated (5 or more lifetime events) (Dulit et al., 1994) and 14 reported infrequent self-mutilation (less than 5 lifetime events).

Written informed consent was obtained from all participants. Copies of consent forms used for all aspects of this investigation are included in Appendix A. Consistent with the definition of superficial to moderate self-mutilation (Favazza & Rosenthal, 1993), data obtained from individuals whose self-mutilation was in response to psychotic thinking were excluded from this research.

5.2.2 Materials

A self-mutilative behaviours checklist was developed to assess the nature and extent of self-mutilative behaviour. Participants were interviewed regarding the frequency and duration of their self-mutilative behaviour. The methods employed, instruments used, and sites of injury also were noted and the length of time between the interview and the most recent self-mutilative episode was recorded. In addition, a structured interview was used to determine history of suicidal behaviour. The number of attempts, methods

used and number of hospitalisations following attempted suicide were noted. Copies of interview schedules and scales used in this study are presented in Appendix B.

A modified form of the Suicide Intent Scale (Beck, Schuyler & Herman, 1974), the Intent Score Scale (Pierce, 1977) was used to assess the suicidal intent associated with self-mutilative behaviour. This scale provided an assessment of the circumstances surrounding the act of self-mutilation, a self report measure of suicidal intent, and the medical risk of death from the behaviour. Subscale scores were combined to provide a total score of suicidal intent.

Assessment of inter-rater agreement following interviews with 16 suicidal individuals was originally conducted to determine the reliability of the Intent Score Scale (Pierce, 1977). Results indicated a high degree of inter-rater reliability (r = .97). In addition, there was a high correlation between total intent scores from the Intent Score Scale and the original Suicidal Intent Scale (r = .93). Results from a follow-up study indicated that repeated administration of the Intent Score Scale can identify fluctuations in lethality and intent of self-destructive behaviours (Pierce, 1981).

In the present study, total scores between 0 and 3 were interpreted as indicative of low suicidal intent as measured by the Intent Score Scale, scores between 4 and 10 were indicative of medium intent, and scores above 11 were interpreted as representative of high suicidal intent (Pierce, 1977).

The Modified Scale for Suicide Ideation (MSSI; Miller, Norman, Bishop & Dow, 1986) was utilised to determine the presence and extent of suicidal thoughts in the present sample. The MSSI was designed to be administered verbally and the 18 items are scored from 0 (no suicidal ideation) to 3 (strong suicidal ideation). The original Scale for Suicidal Ideation (Beck, Kovacs & Weissman, 1979) was modified to include four screening items. Only participants who scored above 1 for any of the screening items were considered to have sufficient suicidal ideation to warrant administration of the entire scale. A total score (out of 54) based on the sum of all items administered was calculated to determine the severity of any suicidal ideas.

Research has demonstrated that the MSSI has excellent internal consistency (r = .94), high inter-rater reliability (r = .99), and exceptional concurrent and construct validity. In addition, the MSSI has been used to reliably distinguish between psychiatric inpatients who have attempted suicide and those who have not (Miller et al., 1986).

5.2.3 Procedure

Participation in this investigation was voluntary. The investigator fully explained the nature of the research, including participation in subsequent studies, prior to obtaining written informed consent. The investigator verbally administered each scale in the form of a structured interview. Participants were debriefed

following this initial session and arrangements for further sessions to obtain data for subsequent studies were made.

5.3 RESULTS

5.3.1 Overview of analyses

Initially, descriptive statistics were utilised to determine the characteristics of the total sample of participants and their self-mutilative behaviour. In addition, 3 separate sets of comparisons were completed. In order to determine if there were any significant differences in the nature and extent of self-mutilation between current and recovered self-mutilation groups, male and female self-mutilation participants, and frequent and infrequent self-mutilation groups, t tests and chi square analyses were employed.

5.3.2 Age, onset and extent of self-mutilation

Mean age of participants was 23.35 years (SD = 7.67, median = 20.00 years, range = 17 to 47 years). Female self-mutilation participants were significantly older than males, t (44) = 2.05, $p < .05$. Mean age for females was 25.22 years (SD = 9.10) and for males 20.68 years (SD = 3.80). There were no significant differences between current and recovered and frequent and infrequent self-mutilation groups in terms of age.

The mean age of onset for self-mutilative behaviour was 17 years (SD = 5.67, median = 15.86, range = 9.5 to 43 years). There were no significant differences between male and female, current and

recovered, or frequent and infrequent self-mutilation participants for behavioural onset.

In total, participants reported a mean of 66.76 episodes of self-mutilation (*SD* = 82.89, median = 30.50, range = 1 to 350 episodes). Only one person reported a single episode of self-mutilation. Less than 10 self-mutilative episodes were reported by 26% of participants. In excess of 50 episodes of self-mutilation were reported for 37% of participants. There were no significant differences between male and female self-mutilation participants or current and recovered self-mutilation groups for total number of self-mutilative episodes reported.

As expected, there was a significant difference between frequent and infrequent self-mutilation participants for total number of self-mutilative episodes, t (41) = 2,78, $p < .01$. Frequent self-mutilation participants reported a mean of 91 episodes of self-mutilation (*SD* = 93.43, median = 43.00, range = 6 to 350 episodes). The infrequent group reported a mean of 20 episodes of self-mutilative behaviour (*SD* = 28.60, median = 6.50, range = 3 to 105 episodes). The mean number of total self-mutilative episodes was inflated for the infrequent group as four of these participants reported a comparatively high behavioural frequency for hitting objects. Infrequent self-mutilation participants reported hitting walls or furniture in anger and that this behaviour most often resulted in superficial physical damage such as bruising. As described earlier, participants were categorised as having engaged in frequent or

infrequent self-mutilation on the basis frequency of skin cutting only to ensure that the severity of the behaviour was consistent between groups.

For the total sample of participants, self-mutilation occurred over a mean period of 5 years (*SD* = 75.73 months, median = 4 years, range = 2 weeks to 30 years). There were no significant differences between male and female, current and recovered, or frequent and infrequent self-mutilation participants for duration of self-mutilative behaviour.

The last episode of self-mutilation occurred a mean of 18 months prior to interview (*SD* = 20.44 months, median = 10.00 months, range = 1 day to 6 years prior to interview). There were no significant differences between male and female or frequent and infrequent self-mutilation participants for the period of time elapsed since the last episode of self-mutilation. As anticipated, the current and recovered groups were distinguished by the period of time elapsed since the last self-injurious episode, t (44) = 7.55, $p < .0001$. The last incident of self-mutilation for the current group occurred a mean of 1.6 months prior to interview (*SD* = 1.27 months). The recovered group reported having last injured themselves a mean of 32 months prior to interview (*SD* = 18.43 months).

5.3.3 Nature of self-mutilation

The majority of participants reported having engaged in skin cutting (97.8%). Participants reported having cut themselves a mean

of 28 times (*SD* = 40.34, median = 15.00, range = 1 to 200). The range of instruments utilised for skin cutting and the percentage of individuals using each method are illustrated in Figure 1.

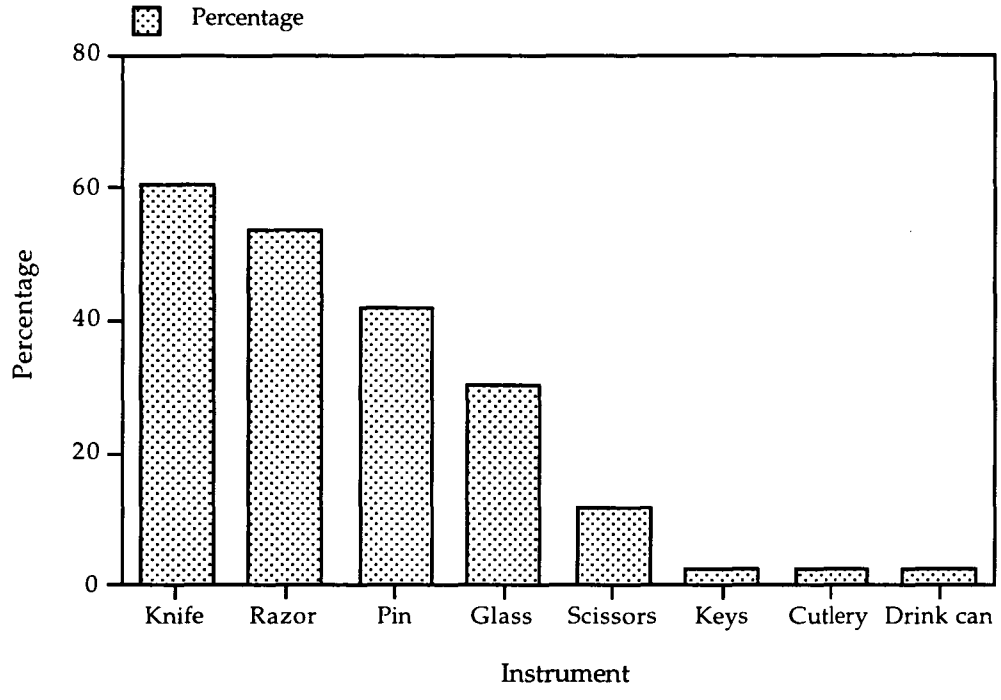


Figure 1. Percentage of self-mutilation participants using various instruments to inflict self-mutilation.

There were no significant differences between male and female or current and recovered self-mutilation participants for frequency of cutting or instruments used. As expected, there was a significant difference between frequent and infrequent self-mutilation groups for total number of skin cutting episodes, t (41) = 3.22, $p < .01$. Frequent self-mutilation participants reported a mean of 41 episodes of skin cutting (*SD* = 44.13, median = 20.00, range = 6 to 200 episodes). The infrequent group reported a mean of 2 episodes of skin cutting (*SD* = 1.15, median = 2.00, range = 1 to 5 episodes). No

between group differences in the type of instrument used to inflict skin cutting were indicated.

Multiple methods of injury

The total sample of participants also reported hitting or punching objects (60.9%), self-burning (39.1%), wound excoriation (26.1%), abrasion (21.7%), self-hitting (21.7%), insertion (19.6%) and biting (8.7%) to inflict injury. Of the total sample, 83% of participants reported having engaged in multiple methods of self-mutilation. On average, these participants reported having used 3 different methods for inflicting injury (SD = 1.15, range = 2 to 6 methods). There were no significant differences between current and recovered self-mutilation groups for multiple methods of injury.

Significant differences in the nature of the self-mutilative behaviour of males and females were noted for hitting. Significantly more males than were statistically expected engaged in hitting objects, χ^2 (1, N = 46) = 4.44, $p < .05$. Of those participants who reported hitting objects, 54% were males and 46% were females. There was no significant difference between males and females who engaged in hitting objects in the frequency of the behaviour. No significant differences between males and females were noted for other methods of self-mutilation.

Significant differences between frequent and infrequent self-mutilation groups were demonstrated for burning, χ^2 (1, N = 43) =

8.03, $p < .01$; and abrasion, χ^2 (1, N = 43) = 6.29, $p < .01$; and a trend towards significance was noted for wound excoriation, χ^2 (1, N = 43) = 4.34, p = .05. For the frequent group, 52% of participants reported having deliberately burnt themselves. Only 7% of infrequent self-mutilation participants reported having engaged in self-burning. In addition, 35% of frequent self-mutilation participants reported that they had utilised skin abrasion as a method of self-mutilation. In contrast, none of the infrequent self-mutilation group had engaged in this behaviour. For the frequent group, 35% of participants reported having engaged in wound excoriation. Only 7% of the infrequent group reported they had interfered with wound healing. No other significant differences between frequent and infrequent groups were noted for multiple methods of injury.

Site of injury

The arm was the most frequently reported site of injury for the total sample of participants (93.2%). The forearm, including wrist, was specified as a site of injury for 50% of participants and the left arm was specified as a site of injury more frequently than the right (left arm = 39.1%, right arm = 7.0%). Participants reported having inflicted injury on most of the body. The percentage of participants who self-mutilated different bodily areas is presented in Figure 2.

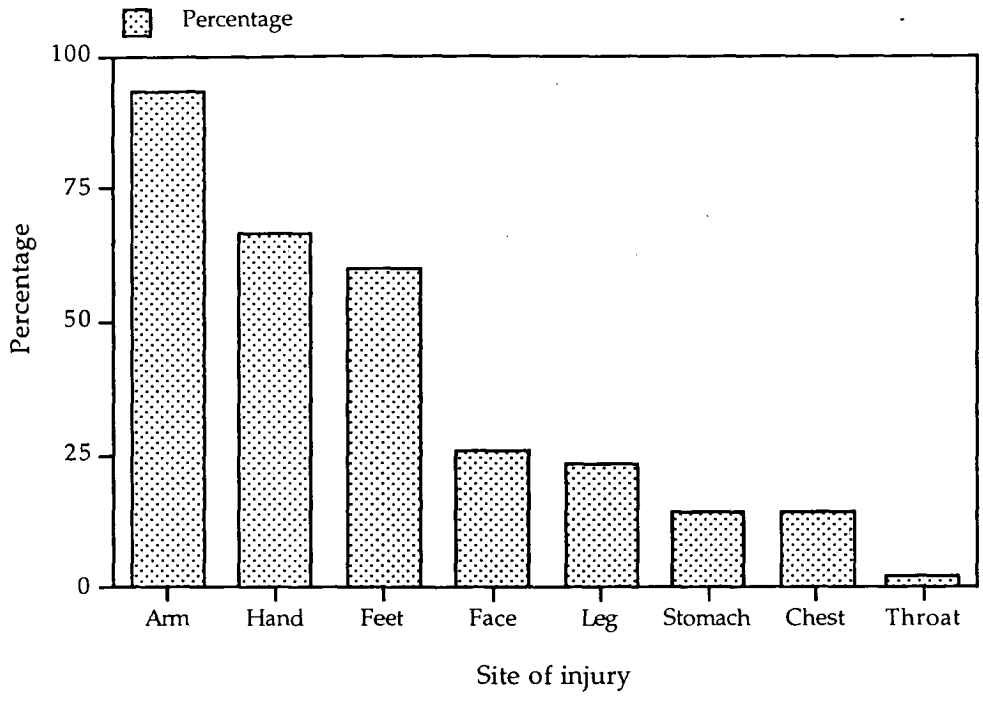


Figure 2. Percentage of participants who self-mutilated various body parts.

No significant differences between current and recovered or frequent and infrequent self-mutilation groups were demonstrated for bodily site selected for self-mutilation. Significantly more males than statistically expected reported the hand as site of injury, χ^2 (1, N = 46) = 6.67, $p < .01$. Of the total sample of participants who reported injuring the hand (n = 30), 53% were male and 47% were female. This difference was accounted for by the higher number of males who reported punching objects as a method of self-mutilation.

Suicidal intent

The suicidal intent associated with self-mutilative behaviour was assessed. The mean score for suicidal intent as measured by the

Intent Score Scale (Pierce, 1977) was 7.57 (*SD* = 3.28). A mean score of 5.72 (*SD* = 2.22) was noted for the Circumstances subscale, a mean of 1.52 (*SD* = 1.95) was noted for the Self-report measure of suicidal intent and a mean of 0.37 (*SD* = 1.00) was indicated for Risk to Life presented by the self-mutilative act.

There were no significant differences between the current and recovered self-mutilation groups or between male and female participants with regard to suicidal intent associated with self-mutilative behaviour. Mean scores and standard deviations for the Intent Score Scale for these participants are presented in Appendix C.

There was a significant difference between frequent and infrequent self-mutilation participants for suicidal intent associated with self-mutilation. The mean total suicidal intent score for frequent self-mutilation participants was significantly higher than for the infrequent group, t (41) = 2.21, $p < .05$. In addition, the frequent group scored significantly higher than the infrequent group for the Circumstances subscale, t (41) = 3.41, $p < .01$. Mean scores for both groups for the Intent Score Scale are presented in Table 6.

Table 6.
Mean scores and standard deviations for the Intent Score Scale for frequent and infrequent self-mutilation participants.

Intent Score subscale	Frequent SM		Infrequent SM	
	M	SD	M	SD
Circumstances	6.48	(1.92)	4.21	(2.29)**
Self-report	1.62	(1.90)	1.57	(2.24)
Medical risk	0.35	(0.61)	0.50	(1.61)
Total Intent Score	8.45	(3.12)	6.14	(3.37)*

*$p < .05$, **$p < .01$.

5.3.4 Help seeking behaviour

Of the total sample of participants, 28% reported that they had sought help from others at some time for managing their self-mutilative behaviour. Participants delayed seeking help from others following their first episode of self-mutilation for a mean of 32 months (SD = 65.11, median = 3.5 months, range = 0 [same day] to 228 months).

There was a significant difference between male and female participants in terms of help seeking behaviour. Significantly more females than statistically expected had sought help from others following self-mutilation, χ^2 (1, N = 46) = 8.44, $p < .01$. Of the total sample of self-mutilation participants, 12 females and 1 male had sought help for managing their self-mutilative behaviour.

No significant differences between current and recovered self-mutilation participants or the frequent and infrequent self-mutilation groups were evident in terms of help seeking behaviour.

5.3.5 Suicidal Ideation

A mean score of 2.28 (*SD* = 6.33, median = 0.00, range = 0 - 28) was demonstrated for the total sample of participants for the MSSI. Following completion of the screening items, only 11% of participants were administered the full MSSI.

There were no significant differences between current and recovered groups, male and female participants, or frequent and infrequent self-mutilation groups in reported degree of suicidal ideation.

5.3.6 Suicidal behaviour

Of the total number of self-mutilation participants, 48% reported a history of suicidal behaviour. Participants reported a mean of 6 suicide attempts (*SD* = 11.73, median = 2, range = 1 to 55 attempts). A range of suicidal behaviours were reported. The percentage of participants who reported attempted suicide by various methods is illustrated in Figure 3. Over half of these suicide attempts resulted in hospitalisation (54.6%).

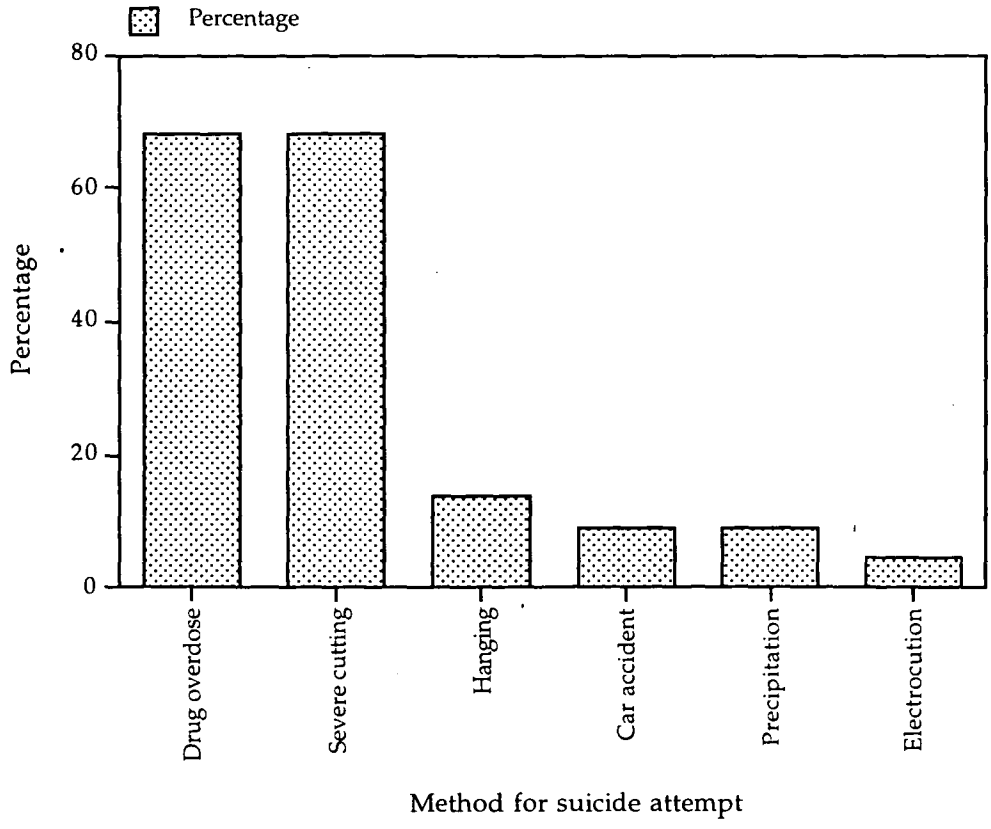


Figure 3. Percentage of participants who attempted suicide by various methods.

No significant difference between current and recovered self-mutilation participants was evident for suicidal behaviour. In addition, no significant difference in the number of suicide attempts reported by male and female participants was noted. In terms of the method selected, significantly more males than statistically expected had attempted suicide by precipitation, χ^2 (1, n = 23) = 6.21, p < .05). However, the total number of participants who reported engaging in this behaviour was extremely low (n = 2). No significant difference between males and females was evident for number of hospitalisations following a suicide attempt indicating a comparable

lethality of the methods selected by male and female self-mutilation participants for attempting suicide.

There was a significant difference between frequent and infrequent self-mutilation groups in the number of participants who reported a history of suicidal behaviour, χ^2 (1, N = 43) = 4.24, $p < .05$. Of the frequent self-mutilation group, 62% of participants reported having attempted suicide. Only 29% of the infrequent group reported suicidal behaviour. There was no significant difference between these groups for number of times suicide had been attempted for participants who reported a history of suicidal behaviour.

5.4 DISCUSSION

5.4.1 Nature and extent of self-mutilation

Results have demonstrated that the traditional profile of a self-mutilating individual that was originally developed using hospitalised self-mutilation groups is generalisable to an outpatient and nonpatient population of people who self-mutilate. In addition, results indicated that the nature and extent of self-mutilative behaviour associated with this profile applies equally well to females and males who engage in self-mutilation.

The majority of participants in the present sample were young (under 25 years of age) although this was not universal. As previous researchers have noted, self-mutilation is not exclusively the domain of the young (Ballinger, 1971; Clendenin & Murphy, 1971; Favazza &

Conterio, 1989; Simeon et al., 1992). The age of individuals who participated in the present investigation ranged from 17 to 47 years. This is consistent with age ranges noted in previous research (Ballinger, 1971; Clendenin & Murphy, 1971; Favazza & Conterio, 1989).

Results demonstrated that female participants in the present investigation were significantly older than male participants. However, inspection of the raw data indicated a greater age range for females (18 - 47 years) than for male participants (17 - 33 years). Of the female participants, 26% were over 30 years of age. In contrast, only one male was aged over 30 years. Rather than indicating that older males do not self-mutilate, it is likely that this result reflects the recruiting techniques used in the present research (university advertising or outpatient referral).

Most people who participated in the present investigation began self-mutilating in adolescence although onset of the behaviour prior to age 10 and after age 40 was noted in a few cases. For the majority of participants, self-mutilation was a repetitive behaviour that had occurred over a number of years. Thirty-five percent of participants reported that they had been self-mutilating for more than five years. Four people reported that they had been engaging in self-mutilation for more than 20 years. Anecdotally, people reported that self-mutilative behaviour waxed and waned over this period, tending to re-emerge in times of distress. This suggests that for some people, self-mutilation represents a life long coping strategy. This

pattern of self-mutilative behaviour has been noted previously (; Favazza, 1992; Favazza & Conterio, 1989; Gardner & Gardner, 1975; Graff & Mallin, 1967; Pattison & Kahan, 1983; Roy, 1978).

As predicted, skin cutting was the most frequently reported self-mutilative behaviour in the present sample. Behaviours such as skin burning, hitting and wound excoriation were reported to a lesser extent. Participants most commonly reported the arm as the site of injury and other bodily areas were injured less frequently. Multiple methods of self-mutilation were reported by most participants. These results are consistent with information derived from previous research (e.g., Favazza & Conterio, 1989; Herpertz, 1995; Langbehn & Pfohl, 1993).

Those who were categorised as frequent self-mutilation participants according to their higher frequency of skin cutting also reported engaging in other self-mutilative behaviours to a significantly greater extent than the infrequent group. The range of behaviours endorsed by frequent self-mutilation participants was consistent with those incorporated in the repetitive self-mutilation syndrome (Favazza, 1992; Favazza & Rosenthal, 1993). Results demonstrated that a more restricted range of behaviours were utilised by the infrequent self-mutilation group indicating that the individual acquires a broader self-mutilative repertoire as the behaviour becomes habitual.

A medium level of suicidal intent was associated with participants' self-mutilative behaviour as measured by the Intent

Score Scale (Pierce, 1977). Inspection of the subscale scores has demonstrated that this total intent score was comprised of a substantially higher mean score for the Circumstances subscale than for other subscales. Self-mutilative behaviour was typically rated to be of low medical seriousness and low levels of self-reported suicidal intent associated with self-mutilation were noted.

As described in Chapter 2, endorsement of Intent Score Scale items assessing circumstances surrounding the act such as isolation, timing so that intervention is unlikely, taking precautions against discovery, and acting to gain help following the behaviour are scored and interpreted as being indicative of an act that is suicidal in nature. However, the need for privacy and lack of help seeking following self-mutilation has been well documented (Favazza & Conterio, 1989; Feldman, 1988; Gardner & Gardner, 1975; Simpson, 1976). Recognition of these characteristics of self-mutilative behaviour have resulted in an artificially high indication of suicidal intent as measured by the Intent Score Scale (Haines et al., 1998).

Significantly higher levels of suicidal intent associated with self-mutilation were indicated for individuals who frequently had engaged in self-mutilation. Inspection of subscale scores indicated that, as for the total sample, the elevated total score was comprised of a Circumstances score that was substantially higher than scores for other subscales. Rather than being indicative of greater suicidal intent associated with self-mutilation, it is likely that individuals

who frequently engage in the behaviour were better practised at maintaining secrecy regarding their self-mutilation.

5.4.2 Help seeking behaviour

Of the present sample of self-mutilation participants, 72% reported that they had never sought help from others for dealing with their self-mutilative behaviour. This figure is substantially higher than for previous community recruited self-mutilation samples (e.g., Favazza & Conterio, 1989). Anecdotally, those individuals who had not sought help for managing self-mutilative behaviour generally had not sought help from mental health professionals for dealing with other problems. The relative lack of help seeking behaviour reported by the present sample is likely to be the result of a sampling artefact. The majority of participants in the current research were self-referred and had responded to internal advertising of the nature of the investigation at the University. Only 13% of participants were referred to the investigator by a treating practitioner.

Less than one third of participants in this largely self-referred sample reported that they had sought help from others at some time for dealing with their self-mutilative behaviour. On average, these participants waited for over two and a half years following the onset of self-mutilation before presenting for treatment. Six people sought professional help within one month of the initial self-mutilative episode and three people waited for more than four years before

seeking help for managing their self-mutilation. One participant reported having engaged in self-mutilation for 19 years prior to presenting for treatment at a mental health facility. Results regarding the nature of help seeking behaviour in the current sample are consistent with previous research (Favazza & Conterio, 1989).

It was of particular interest that there were no significant differences between current and recovered self-mutilation participants in terms of help seeking behaviour. This result has indicated that a proportion of individuals who self-mutilate are able to effectively control the behaviour without professional or personal assistance. The factors that contribute to the cessation of the behaviour require further investigation.

No significant differences in help seeking behaviour were noted between individuals who reported having engaged in self-mutilation frequently and those who reported infrequent self-mutilation. This result has suggested that even when self-mutilation becomes habitual some people do not consider the behaviour to be a problem or that they prefer to attempt to manage it alone.

As predicted, there was a significant difference between males and females for help seeking behaviour. Of the total sample of participants, 12 females had sought help for managing self-mutilation. Only one male reported seeking help from others. As noted, most self-mutilation research has been conducted using inpatient populations or people who had referred themselves for

treatment. Perhaps as a result of this sampling, self-mutilation most commonly has been associated with females. It seems more likely that near equal sex ratios for self-mutilation exist in the community (Clendenin & Murphy, 1971; Weissman, 1975) and that a large proportion of people who self-mutilate may never come into contact with psychiatric or other mental health services.

5.4.3 Suicidal behaviour

Almost half of the participants in the present investigation reported a history of suicidal behaviour. Most commonly, suicide attempts by self-poisoning with medication and severe skin cutting were described. Previous research has demonstrated the popularity of these methods for attempting suicide with individuals who self-mutilate (Favazza, 1992; Langbehn & Pfohl, 1993; Schwartz et al., 1989). Suicide attempts associated with higher medical risk (e.g., hanging, precipitation, electrocution, car accident) were reported to a much lesser extent.

Research has indicated that the suicide attempts made by self-mutilating individuals typically are of lower lethality than attempts made by people with no history of self-mutilation and that a proportion of individuals who self-mutilate make multiple suicide attempts (Langbehn & Pfohl, 1993). Results from the present sample are consistent with these impressions. For some participants, attempted suicide was a repetitive behaviour. Of those who reported a history of suicidal behaviour, 27% had attempted suicide on five or

more occasions. One participant reported 20 incidents of attempted suicide, another reported 55 suicide attempts. All of these attempts were by self-poisoning with medication or severe skin cutting. These results support the notion outlined in Chapter 2 that for some people, self-mutilation and repetitive parasuicidal behaviour represent part of a broader self-harm phenomenon.

It has been suggested that individuals who habitually self-mutilate may attempt suicide as a result of desperation associated with lack of control of their self-mutilative behaviour (Favazza, 1992; Favazza & Conterio, 1989). Indeed, a greater proportion of the frequent self-mutilation group in the present sample reported a history of suicidal behaviour. It may be that this group were more distressed and were more likely to attempt suicide as a result of this distress. If this was the case, it would be expected that the frequent self-mutilation group would score more highly on measures that reflect a distressed emotional state, such as suicidal ideation. However, no association between suicidal ideation and repetitive self-mutilation was evident in this sample.

Previous research has indicated that higher levels of suicidal ideation are reported by people who frequently self-mutilate (Dulit et al., 1994). In the present investigation, the total sample of participants evidenced minimal levels of suicidal ideation as measured by the MSSI. The full scale of the MSSI is only completed if the first 4 screening items are endorsed (Miller et al., 1986), consequently, only five people were administered the full MSSI.

These results may indicate that the association between suicidal ideation and self-mutilative behaviour is not particularly robust. Indeed, researchers have suggested that suicidal ideation reported by people who self-mutilate should be interpreted with caution (Stanley et al., 1992). Self-mutilative behaviour may not represent an urge to act out suicidal ideas. Rather, the aim of self-mutilation may be to relieve these unpleasant and distressing thoughts which may be associated with other problematic symptoms (e.g., depression). Later studies in the present investigation address this issue.

5.4.4 Summary and conclusions

In accordance with the traditional profile of an individual who self-mutilates, participants in the present investigation generally, although not exclusively, were young and had begun to self-mutilate in adolescence. Most participants engaged in skin cutting. Other methods of self-mutilation were reported to a lesser extent. Self-mutilation was of low lethality and was associated with relatively low levels of suicidal intent. For a substantial proportion of individuals, self-mutilation was a repetitive behaviour. Almost half of the participants reported a history of attempted suicide, most commonly by self-poisoning or severe skin cutting. For some participants, attempted suicide represented a repetitive behavioural pattern. These results have demonstrated that the traditional profile of an individual who self-mutilates originally derived using

inpatient samples is generalisable to a broader population who engage in this behaviour.

The lack of differences between current and recovered self-mutilation groups in reported history of self-mutilative behaviour in the present study has demonstrated that factors indicated in subsequent studies to be associated with the cessation of the behaviour were not associated with type or severity of self-mutilation or with help seeking behaviour.

Results were consistent with the notion that at least one third of individuals who self-mutilate are male. Early researchers suggested that the self-mutilative behaviour of males and females was phenomenologically different. Results of the present investigation have indicated that this is not the case and that the nature and extent of the self-mutilative behaviour of males and females is comparable.

Results from the present investigation also have suggested that individuals who frequently self-mutilate are more distressed than individuals who have infrequently engaged in the behaviour as evidenced by the greater proportion of the frequent self-mutilation group reporting a history of attempted suicide. Investigation of the symptomatology associated with habitual self-mutilation and infrequent self-mutilative acts should clarify the role of distress in the development of a repetitive pattern of self-mutilation.

In order to understand how discrete episodes of self-mutilation develop into a repetitive behavioural cycle it is necessary

to clarify the specific purposes and mechanisms of the behaviour itself. Researchers consistently have reported that self-mutilation is a response to emotional distress and that the act itself serves to dissipate this unpleasant state. The following chapter details the components of this process.

CHAPTER 6

THE PHENOMENOLOGY OF SELF-MUTILATION

Researchers have devoted considerable attention to clarifying the characteristics of individuals who self-mutilate, identifying risk factors for the development of self-mutilation, and describing the nature and extent of self-mutilative behaviour (e.g., Favazza & Conterio, 1988, 1989; Gardner & Gardner, 1975; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Pao, 1969; Rosenthal et al., 1972; Simpson, 1975, 1976). However, the treatment strategies that have been based on this information largely have been unsuccessful in consistently combating self-mutilation (Feldman, 1988; Raine, 1982; Simpson, 1976; Thorburn, 1984). In order to develop effective therapeutic strategies, a greater understanding of the specific purposes of the behaviour and the factors that maintain self-mutilation is required.

A review of the literature has indicated a plethora of reports documenting the phenomenology of self-mutilation (e.g., Favazza & Conterio, 1989; Feldman, 1988; Gardner & Gardner, 1975; Grunebaum & Klerman, 1967; Rosenthal et al., 1972; Simpson, 1975, 1976; Siomopoulos, 1974). In fact, clinical and anecdotal reports have described a consistent pattern concerning the self-mutilative act. Even reports from the apparently most diametrically opposed disciplines of psychology, learning theory and psychodynamics, have described a pattern of tension reduction following self-mutilation (e.g., Arons, 1981; Bennun [sic], 1984; Siomopoulos, 1974). However, there have been few systematic investigations of the mechanisms of the self-mutilative act (Herpertz, 1995).

Skin cutting is the most frequently utilised type of self-mutilation (Feldman, 1988). The phenomenology of self-mutilation will be discussed here in terms of a skin cutting episode. This is not to suggest that the processes described are exclusive to skin cutting. Reports have indicated that other forms of low lethality deliberate self-harm also exhibit tension reducing qualities (Driscoll, Brain, Haines & Williams, 1997; Driscoll, Williams & Haines, 1996; Favazza & Conterio, 1989; Pattison & Kahan, 1983; Walsh & Rosen, 1988).

6.1 Preceding emotional state

A range of feelings have been reported to precede self-mutilation. Mounting anxiety, anger, depression, frustration, self-hatred, despair and particularly intolerable tension all have been described (Favazza, 1992; Grunebaum & Klerman, 1967; Kahan & Pattison, 1984; Simpson, 1976; Schwartz et al., 1989). Fluctuating feelings of sadness and dejection that are qualitatively different from classical depression have been noted (Grunebaum & Klerman, 1967).

Individuals have reported feeling bad tempered, morose and irritated prior to self-mutilating (Herpertz, 1995). Escalating feelings of anxiety and anger have been identified as core elements of the phenomenology of self-mutilation (Langbehn & Pfohl, 1993; Simpson, 1975; Stanley et al., 1992). Participants have reported feelings of anger towards themselves and towards others that lead to self-mutilation (Bennum, 1983; Gardner & Gardner, 1975). As negative feelings escalate unbearable tension becomes the dominant

affect (Herpertz, 1995; Simpson, 1975; 1976). In contrast, some individuals have reported that the urge to hurt themselves arises quickly, without antecedent symptoms (Langbehn & Pfohl, 1993).

Researchers have suggested that the mood that precedes self-mutilative behaviour is not qualitatively different from the individual's long standing affective traits (Herpertz, 1995; Simeon et al., 1992). The symptomatology associated with self-mutilation will be discussed in detail in the following chapter.

Unpleasant feelings that precede self-mutilation have been reported as reactions to the experience or threat of loss or abandonment, separation, rejection, loss of a meaningful person, or disruption or disintegration of interpersonal relationships (Feldman, 1988; Herpertz, 1995; Simpson, 1975; 1976). These feelings of loss or abandonment may be associated with real or misinterpreted disruptions in interpersonal relationships (Feldman, 1988). The individual may feel unable to express the intensity of the negative feelings associated with these events in words (Simpson, 1975).

Researchers have noted that for the individual who habitually self-mutilates, the stressor that precedes the act need only be a minor anxiety provoking event (Walsh & Rosen, 1988). Negative feelings continue to escalate leading to a 'constriction of cognitive-perceptual process', a narrowed perspective concerning the situation and personal alternatives for action (Pattison & Kahan, 1983). Self-mutilation is perceived as the only option for managing mounting negative feelings.

6.2 Contemplation of self-mutilation

As unpleasant feelings continue to escalate, the individual generally becomes aware of the desire to self-mutilate (Pao, 1969). An internal struggle against the recurrent, intrusive impulses to self-mutilate has been reported (Feldman, 1988; Pao, 1969; Pattison & Kahan, 1983; Simpson, 1976). As negative feelings continue to mount the situation is perceived as intolerable and uncontrollable (Feldman, 1988; Pattison & Kahan, 1983). Upon realisation that cutting is going to occur, some mild relief may be experienced as plans to do so formulate (Podvoll, 1969; Simpson, 1976). As the behaviour becomes habitual, the individual may become resigned to the fact that only self-mutilation can provide the desired instant relief from tension (Walsh & Rosen, 1988).

Repetitive self-mutilation typically has been considered to be an impulsive behaviour (Favazza, 1992; Favazza & Simeon, 1995; Graff & Mallin, 1967; Siomopoulos, 1974). In one sample, 70% of self-mutilating participants reported that they had no control over their self-mutilative acts (Bennum, 1983). In another, 78% of participants reported that they decided to cut on the spur of the moment and 15% made the decision to cut within an hour prior to the execution of the act (Favazza & Conterio, 1989). In a further study, the self-mutilative behaviour of 61% of participants was considered to be impulsive (Herpertz, 1995).

It has been suggested that self-mutilative behaviour represents a disorder of impulse control (Favazza, 1992; Favazza & Rosenthal,

1993). This will be discussed in detail in Chapter 7. Although self-mutilation has been interpreted as resulting from a failure to resist an impulse, some individuals who self-mutilate may ponder harming themselves for hours or days prior to actually engaging in the behaviour (Favazza & Rosenthal, 1993). For these individuals, ritualistic behaviours such as tracing areas of their skin or placing self-mutilation paraphernalia in a special order may precede the act of self-mutilation.

6.3 Isolation

Immediately prior to self-mutilating individuals usually seek solitude if not already alone (Feldman, 1988; Simpson, 1976). Indeed, the private nature of the self-mutilative act has been emphasised (Gardner & Gardner, 1975). Incidents of individuals self-mutilating in front of others have been documented (Favazza & Conterio, 1989; Wilmotte & Plat-Mendlewicz, 1973). In one sample half of the participants admitted that they had self-mutilated in the presence of another person (Favazza & Conterio, 1989). Manipulative motivations have been suspected in circumstances of public self-mutilation (Claghorn & Beto, 1967; Nelson & Grunebaum, 1971). An alternative explanation is that the impulse to self-mutilate is so overwhelming that self-control or delay of the act may be impossible (Favazza & Conterio, 1989).

6.4 Depersonalisation

As mounting tension becomes unbearable, transition into a state of depersonalisation often has been reported (Feldman, 1988; Gardner & Gardner, 1975; Pao, 1969; Rosenthal et al., 1972; Simpson, 1976; Winchel & Stanley, 1991), but this is not universal (Simpson, 1976). Self-mutilating individuals have reported that feelings of emptiness, numbness, trance-like states, experiences of depersonalisation and derealisation, and a changed body perception immediately precede the act of self-mutilation (Feldman, 1988; Herpertz, 1995). Individuals have reported that in this state injury occurs quite suddenly (Feldman, 1988; Pao, 1969; Simpson, 1975, 1976). Individuals have reported a lack of direct awareness of cutting (Simpson, 1976) although wound length, depth and site appear carefully chosen (Feldman, 1988; Kaplan & Fik, 1977).

The lack of pain that is typically reported during self-mutilation has been attributed to the depersonalised state (Grunebaum & Klerman, 1967; Pao, 1969; van Moffaert, 1990; Waltzer, 1968). Some may experience more extreme dissociation and report limited recollection of the self-mutilative act (Feldman, 1988; Pao, 1969; Simpson, 1976). Total amnesia for self-mutilative behaviour has been reported to be rare (Langbehn & Pfohl, 1993).

6.5 Pain

Reports have indicated some variation in the experience of pain associated with self-mutilation. Pain most commonly has been

reported as absent for the duration of the cutting episode (Feldman, 1988; Gardner & Gardner, 1975; Graff & Mallin, 1967; Rosenthal et al., 1972; Roth, Ostroff & Hoffman, 1996; Simpson, 1976). More than half of one sample of 54 participants reported a marked absence of pain during self-mutilation. Fewer participants (33%) reported normal pain sensation at the time of injury (Herpertz, 1995). Two thirds of the 240 female participants in one study demonstrated little or no pain with self-mutilation. Moderate pain was experienced by 23% of participants and great pain was reported to accompany self-mutilation by only 10% (Favazza & Conterio, 1988, 1989).

Some individuals have described feeling pleasure rather than pain upon cutting (Feldman, 1988; Graff & Mallin, 1967). Others have reported that the experience of painful cutting is accompanied by feelings of relief (Winchel & Stanley, 1991). Some individuals who experience painful cutting have described a need to transform uncontrollable psychological torment into a manageable physical sensation (Feldman, 1988). Others have reported feeling reassured by the capacity to feel physical sensation (Winchel & Stanley, 1991).

For those who do not experience pain, the return of painful sensation has been reported to range from minutes to several hours following self-cutting (Gardner & Gardner, 1975) to the extent that sutures have been applied without the need for anaesthesia (Bennun [sic], 1984; Grunebaum & Klerman, 1967).

Painless self-mutilation has been explained by the anaesthetic qualities that the depersonalised state provides (Grunebaum &

Klerman, 1968; Pao, 1969; Waltzer, 1968). Currently, there is no data that supports or refutes this contention (Russ, Clark, Cross, Kemperman, Kakuma & Harrison, 1996). Some people have reported that sensation has not returned for hours, or even days following the cutting episode (Simpson, 1976). This typically exceeds the depersonalisation experience.

Recent research has demonstrated that individuals diagnosed with borderline personality disorder for whom self-mutilation was painless, experienced a higher rate of dissociative symptoms than those who reported painful self-mutilation (Russ et al., 1996). In addition, the 'no pain' group were less able to discriminate between imaged items depicting extremely painful and mildly painful situations than the group who experienced painful self-mutilation. The authors interpreted the results of this research as indicating that individuals who report analgesia during self-mutilation use a dissociative type coping strategy to reinterpret the pain sensation associated with the self-mutilative act. Further research is required to confirm this interpretation.

Research has indicated that the experience of analgesia with self-mutilation may be influenced by changes in endogenous opioid levels in the central nervous system (Roth et al., 1996). In one study, participants who engaged in painless self-mutilation reported more severe histories of childhood sexual abuse than participants for whom self-mutilation was painful (Russ, Shearin, Clarkin, Harrison & Hull, 1993). It has been suggested that individuals with severe

abuse histories become habituated to high levels of endogenous opioids due to recurrent exposure to abusive or traumatic experiences. As a result, these individuals may require supranormal levels of endorphins to cope with stress as adults. Theoretically, self-mutilation may provide a maladaptive means to accomplish these levels. Alternatively, self-mutilative behaviour could be the result of an instability of endogenous opioids, with dysphoria being associated with temporarily low levels. It has been suggested that self-mutilation acts as a catalyst for the release of endogenous opioids and a reduction in the unpleasant dysphoric state (Roth et al., 1996).

Researchers have speculated that if the endogenous opiate system is central to maintaining self-mutilative behaviour, then treatment with a long-acting opiate antagonist (e.g., naltrexone) could block the reward mechanism of enhanced endogenous opioids that is caused by self-mutilation and lead to an extinction of the behaviour (Roth et al., 1996). In one study, naltrexone was used to significantly reduce or eliminate self-mutilative behaviour in all 7 participants (Roth et al., 1996). These results were extremely promising. However, the authors emphasised caution in their interpretation. All participants demonstrated chronic self-mutilation accompanied by analgesia and dysphoria reduction. The authors stressed the importance of double-blind, placebo-controlled follow-up studies to accurately determine the efficacy of naltrexone as a treatment for self-mutilation and to clarify the role of the endogenous opioid system in the maintenance of self-mutilative behaviour (Roth et al., 1996).

6.6 Blood

Reports have indicated that blood has special significance for some individuals who self-mutilate (Pao, 1969; Simpson, 1976; Feldman, 1988). It has been suggested that the sight of blood mediates an end to feelings of depersonalisation and dissociation (Simpson, 1975). The individuals' own blood from a self-inflicted wound is specifically sought. Blood from an accidental injury, menstrual blood, or the blood of another person will not provide the desired tension relief (Feldman, 1988).

Positive reactions to the sight of blood and feelings of immediate relief have been described as the blood appears in the self-inflicted wound (Rosenthal et al., 1972; van Moffaert, 1990). Some individuals have reported that they stop cutting when they have 'had enough blood' (Feldman, 1988; Simpson, 1975). Those who have complained of still feeling tense following cutting have claimed that they 'did not get enough blood' (Rosenthal et al., 1972).

The flow of blood from a self-inflicted wound has been described as warm and comforting (Favazza, 1989a; Feldman, 1988). Researchers have emphasised the positive manner by which some individuals describe their bleeding wounds (e.g., Simpson, 1975, 1976). In one study, 47% of 240 participants indicated that the sight of blood was comforting and 25% reported that they like to taste their blood (Favazza & Conterio, 1989). In addition, it has been noted that some individuals derive comfort from carrying objects such as blood soaked tissues or small containers of their own blood (Favazza, 1992).

The act of self-mutilation has been described by individuals who engage in the behaviour as pleasurable (Graff & Mallin, 1967). Some authors have likened the processes of self-mutilation to sexual intercourse or masturbation (Simpson, 1975, 1976; Siomopoulos, 1974). Escalating tension has been reported to precede self-mutilation followed by an orgasmic quality of relief and pleasure as the blood flows from the self-inflicted wound promoting a feeling of relaxation (Simpson, 1976). However, the act of self-mutilation itself rarely generates sexual arousal (Favazza & Conterio, 1989; Feldman, 1988).

6.7 Repersonalisation and tension reduction

The act of self-mutilation has been reported to be effectively therapeutic and provide rapid relief from psychological distress (Brain et al., in press, 1998; Favazza & Conterio, 1989; Gardner & Gardner, 1975; Haines, Williams, Brain et al., 1995; Herpertz, 1995; Lion & Conn, 1982; Pao, 1969; Rosenthal et al., 1972; Simpson, 1975, 1976). Self-mutilation has been associated with euphoria, relief from feelings of depression, loneliness and alienation, decreased troublesome sexual feelings or enhanced sexual feelings, release of anger, establishing control, satisfaction from self-punishment, a sense of security and uniqueness, and manipulation of others (Favazza & Rosenthal, 1993).

In particular, reports have consistently indicated that self-mutilation acts as a catalyst for tension reduction and repersonalisation for those who previously experienced dissociative

symptoms (Brain et al., in press, 1998; Favazza & Conterio, 1989; Gardner & Gardner, 1975; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Haines, Williams, Brain et al., 1995; Lion & Conn, 1982; Pao, 1969; Rosenthal et al., 1972; Simpson, 1975, 1976; van Moffaert, 1990). In one study of 54 female psychiatric inpatients, self-mutilation was reported to immediately relieve unpleasant dysphoric states. Sixty-nine percent of these participants reported that they felt better for some time following self-mutilation (Herpertz, 1995). In other research, 66% of 240 participants reported that they felt better immediately following self-mutilation (Favazza & Conterio, 1989).

Relief following self-mutilation is short lived and deceptive (Favazza & Conterio, 1989; Lion & Conn, 1982). Reports have indicated that, for some individuals, the relief that self-mutilation provides is followed by feelings of self-hatred, disappointment, fear of the consequences of the act, or a sense of badness (Feldman, 1988). Although self-mutilation effectively provides temporary relief from unpleasant feelings, the individual's underlying psychopathology remains unchanged (Favazza & Conterio, 1989; Schwartz et al., 1989). However, due to its rewarding nature, self-mutilation typically is repeated when troublesome psychological symptoms re-emerge (Favazza & Conterio, 1989; Tantam & Whittaker, 1992). Reports have indicated that once it is established as a behavioural cycle, self-mutilation is perceived as an addiction by individuals who engage in

the behaviour (Favazza & Conterio, 1989; Graff & Mallin, 1967; Simpson, 1976).

6.8 Summary

A consistent pattern with regard to the act of self-mutilation has been documented. Reports have indicated that a range of negative or unpleasant feelings, often precipitated by problems associated with interpersonal relationships, precede self-mutilative behaviour. As these unpleasant feelings continue to escalate, tension becomes the predominant affect and individuals may become aware of the need or desire to self-mutilate and seek solitude if not already alone. As mounting tension becomes unbearable, transition into a state of depersonalisation may occur. The self-mutilative act generally has been reported to occur suddenly and painlessly and the sight of blood triggers a reduction in tension and dissipation of associated feelings of distress.

Although there may be some individual variation in the experience of specific components of the self-mutilative act, anecdotal and clinical reports consistently have reported that the act of self-mutilation serves to effectively relieve feelings of psychological distress and intolerable tension. These reports have provided some understanding regarding the reasons people engage in self-mutilation and the factors that maintain the behaviour. The relief that self-mutilation provides from the distressing emotional state is rewarding yet short lived and serves to increase the

likelihood of the behaviour occurring again when problematic symptoms recur.

From a treatment perspective, the consistency of reports regarding the phenomenology of self-mutilation have highlighted the importance of viewing self-mutilation as a distinct behavioural entity rather than as a symptom of a disorder. In order to devise an effective treatment regime for self-mutilation a more detailed understanding of the specific components of the self-mutilative act and the contribution of these components to the development and maintenance of a repetitive behavioural pattern is required. Indeed, the present investigation aims to clarify the reinforcement components of the self-mutilative act.

As outlined, a range of symptoms have been associated with the self-mutilative act. Unpleasant feelings that precede self-mutilation have been reported to occur generally as a result of interpersonal difficulties. Indeed, research has indicated that individuals who self-mutilate are deficient in communication and social skills (Feldman, 1988; Grunebaum & Klerman, 1967; Novotny, 1972; Rosenthal et al., 1972; Simpson, 1975, 1976; Walsh & Rosen, 1988). However, treatment programmes that have focused on the development of these skills largely have been unsuccessful in controlling self-mutilative behaviour (Feldman, 1988; Raine, 1982; Simpson, 1976; Thorburn, 1984).

Research has indicated that the symptoms that precede self-mutilation are not qualitatively different from the individual's

underlying affective traits. It makes sense to consider that if these symptoms associated with the behaviour are controlled, the need to self-mutilate would effectively be reduced. The second study in the present investigation addresses this issue.

Prior to embarking on any investigation regarding the symptomatology of self-mutilation it is important to comprehend the range of symptoms associated with the behaviour and the role of each symptom in the self-mutilative process. The following chapter details this information.

CHAPTER 7

SYMPTOMATOLOGY ASSOCIATED WITH SELF-MUTILATION

The symptom of self-mutilation generally has been considered to reflect severe psychopathology (Rosenthal et al., 1972; Stanley et al., 1992). A variety of diagnoses have been applied to individuals who self-mutilate and self-mutilation has been associated with a range of psychological disorders (Favazza & Simeon, 1995).

Most commonly, individuals who self-mutilate have been diagnosed with borderline personality disorder (Feldman, 1988; Fryer, Frances, Sullivan, Hurt & Clarkin, 1988; Pattison & Kahan, 1983; Schaffer et al., 1982; Simeon et al., 1992). The DSM-IV has included self-mutilation as a diagnostic feature of this disorder (American Psychiatric Association, 1994). In one study of individuals diagnosed with borderline personality disorder, participants with a history of self-mutilation exhibited significantly more severe borderline traits than those who had never engaged in the behaviour (Simeon et al., 1992). Research has indicated that self-mutilation does occur frequently in individuals with borderline and histrionic personality disorder, but not necessarily or exclusively (Pattison & Kahan, 1983).

Some authors have cautioned against a self-fulfilling hypothesis confirmation when labelling individuals who self-mutilate with borderline personality disorder (Schaffer et al., 1992). It may be that the diagnosis is made because the individual self-mutilates, rather than because self-mutilative behaviour occurs in conjunction with other indicators of borderline personality disorder. Research has demonstrated no significant differences between self-mutilation participants diagnosed with borderline personality

disorder and a non-personality disordered self-mutilation group in terms of the phenomenology of self-mutilation (Herpertz, 1995). In addition, a prisoner self-mutilation sample who demonstrated significant symptomatology did not evidence borderline characteristics (Haines et al., 1995).

Individuals who self-mutilate have been diagnosed with schizophrenia (Graff & Mallin, 1967; Rosenthal et al., 1972) and psychotic disorders (House & Thompson, 1985; Maloney et al., 1987; Pao, 1969). However, people who engage in low lethality self-mutilation rarely exhibit florid psychotic symptoms (Simpson, 1976). In addition, in one sample of 14 self-mutilation participants who were diagnosed with schizophrenia, only 6 demonstrated any evidence of delusions or hallucinations (Rosenthal et al., 1972). As described in Chapter 3, the self-mutilative behaviour of people responding to disordered thoughts or perceptions typically has been categorised as distinct from superficial to moderate self-mutilation (Favazza, 1992; Favazza & Rosenthal, 1993).

Self-mutilation also has been described as a symptom of antisocial (Virkkunen, 1976) and histrionic personality disorder (Pfohl, 1991), post-traumatic stress disorder (Pitman, 1990), dissociative disorders (Coons & Milstein, 1990; Ross & Norton, 1989), eating disorders (Favazza et al., 1989; Pao, 1969; Rosenthal et al., 1972; Simpson, 1975) and factitious disorder (House & Thompson, 1985). Regardless of the individual's diagnosis, the symptoms that have been associated with self-mutilation and the phenomenology of the

behaviour have been described as almost stereotypical. The following sections aims to describe the range of symptoms that have been reported to accompany self-mutilative behaviour. Research has indicated that the affective state at the time of self-injury is qualitatively similar to the individual's longstanding affective traits (Herpertz, 1995).

7.1 Depression

Many reports have associated self-mutilation with depression (Bennum, 1983; Darche, 1990; Pattison & Kahan, 1983; Simpson, 1975) although self-mutilative behaviour has not been frequently reported in conjunction with major depressive disorder (van Moffaert, 1990). Research has indicated that individuals who self-mutilate evidence higher levels of depression than control groups (Bennum, 1993; Darche, 1990; Graff & Mallin, 1967; Rosenthal et al., 1972). For example, one sample of 48 female adolescent inpatients who engaged in low lethality self-mutilation evidenced more severe levels of self-reported depressive symptoms than an age matched psychiatric inpatient control group (Darche, 1990).

In contrast, other research has indicated differences in level of depression between self-mutilation and control personality disorder groups for an observer rating scale only. No differences between the groups were noted for self-ratings of depression or hopelessness (Simeon et al., 1992). In fact, a significant negative correlation between degree of self-mutilative behaviour and reported

hopelessness was evident. The authors interpreted this result as indicative of the effectiveness of self-mutilation in restoring hopeful affect.

Research has indicated that there are qualitative differences in the depression experienced by individuals who self-mutilate when compared to psychiatric control participants (Bennum, 1983; Simpson, 1976). One study compared the depressive symptoms of 20 self-mutilation participants with a control group diagnosed with depression (Bennum, 1983). Specific item differences on the BDI were noted. The self-mutilation group scored higher on items assessing guilt, self-punishment, self-dislike and poor body image. In contrast, the depressed group demonstrated higher ratings on items that measured crying, disturbance of sleep, loss of appetite and low libido. The quality of the affective state associated with the act of self-mutilation in this sample was an agitated depression. Indeed, vegetative symptoms of depression often are absent in individuals who self-mutilate (Bennum, 1983; Simeon et al., 1992). Instead, higher levels of anxiety, somatisation and cognitive disturbance have been indicated for people who engage in self-mutilation in comparison with personality disordered control participants (Simeon et al., 1992).

In one study of 30 individuals who cut their wrists, a distinct subgroup of people with depressive symptoms was identified (Takeuchi et al., 1986). The wrist cutting behaviour of this subgroup was different to the low lethality, frequent wrist cutting of other

participants. For the depression group, wrist cutting was interpreted as a rehearsal for suicide. These individuals cut themselves infrequently, when they were in a depressed or anxious state, and evidenced definite suicidal ideation. In addition, they had a more extensive history of attempted suicide by self-poisoning or hanging. The wrist cutting of these individuals was similar to the course cutting behaviour outlined by previous researchers (Kaplan & Fik, 1977; Pao, 1969). These authors also noted an association between severity of self-mutilation and depressive affect.

A lability of mood, rather than prolonged depressive episodes, has been associated with self-mutilative behaviour (Simpson, 1975, 1976). It has been proposed that poor affect regulation is the underlying psychopathological dimension of self-mutilation (Zweig-Frank et al., 1994a). Researchers have noted that individuals who self-mutilate have described as problematic sudden, unpredictable mood swings (Grunebaum & Klerman, 1967; Simpson, 1975).

7.2 Anxiety

Anxiety has been identified as a core element of the phenomenology of self-mutilation (Favazza, 1992; Feldman, 1988; Gardner & Gardner, 1975; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Rosenthal et al., 1972; Simpson, 1975; Stanley et al., 1992). Escalating feelings of anxiety and intolerable tension commonly have been reported to precede self-mutilative behaviour

(Favazza, 1992; Feldman, 1988; Herpertz, 1995; Langbehn & Pfohl, 1993; Simpson, 1975, 1976; Stanley et al., 1992).

In one study, a significantly higher proportion of self-mutilation than psychiatric control participants had been diagnosed with an anxiety disorder (Darche, 1990). In other research, individuals who self-mutilate have reported higher levels of anxiety than both depressive and non-psychiatric control groups (Bennum, 1983).

It has been suggested that the level of anxiety experienced by the individual is related to the severity of self-mutilative behaviour (Kaplan & Fik, 1977; Simeon et al., 1992). In one study, degree of self-mutilation was significantly correlated with somatic anxiety, but not with psychic anxiety (Simeon et al., 1992), emphasising the role of physiological discomfort in self-mutilative behaviour. In other research, a self-mutilation group evidenced significantly elevated scores for the anxiety and somatisation subscales of a symptom check list in comparison with a psychiatric control group (Darche, 1990). These results were consistent with the recurrent theme in the literature that individuals who self-mutilate have minimal tolerance for tension and use self-mutilation as a means to dispel feelings of increasing psychophysiological distress (Brain et al., in press, 1998; Haines, Williams, Brain et al., 1995). Indeed, three quarters of one self-mutilation sample described feelings of tension as a primary or secondary problem (Simpson, 1975). Significantly fewer control participants cited tension as their most troublesome complaint.

As noted, researchers have suggested that the symptoms associated with the self-mutilative act are not qualitatively different from the individual's underlying affective traits (Herpertz, 1995). To some extent, this notion has been supported by results from early research (McKerracher et al., 1968). In this study, degree of anxiety did not significantly differentiate currently mutilating individuals from those no longer engaging in the behaviour indicating that anxiety is an enduring trait of individuals with a history of self-mutilation. However, this research was conducted using a small sample size (N = 21) of individuals who were considered psychotic or intellectually disabled. The association between symptoms associated with the self-mutilative act and the nature of symptomatology generally experienced by individuals who self-mutilate requires empirical verification.

7.3 Aggression and hostility

Researchers have emphasised the role of aggressive feelings in self-mutilative behaviour. Anger towards the self has been reported by 18% to 45% of self-mutilation participants in different studies, and 10% to 32% have reported anger towards others as preceding self-mutilative acts (Bennum, 1983; Gardner & Gardner, 1975; Roy, 1978). Early researchers interpreted self-mutilative behaviour as an expression of anger and hostility directed towards the self (e.g., Menninger, 1935). In addition, self-mutilation has been considered

to be the result of a profound incapacity to express aggression effectively and externally (Raine, 1982).

To date, research has not supported the notion that self-mutilative behaviour is representative of anger turned towards the self. Although intropunitive hostility scores did distinguish a self-mutilation and medical control group in one study, no differences in intropunitive hostility were noted between the self-mutilation and a non-mutilating group diagnosed with depression (Bennum, 1983). Higher levels of extrapunitive hostility, in particular the urge to act out hostility, were demonstrated for the self-mutilation group in comparison with depressive and medical control groups (Bennum, 1983). In more recent research, self-mutilating prisoners scored significantly higher on measures of the impulse or urge to act out hostile feelings, critical feelings towards others, paranoid feelings of hostility and feelings of guilt than non-mutilating prisoner control participants and a non-mutilating, non-prisoner control group (Haines et al., 1995). For all groups, hostile feeling were directed towards other people.

Further research has considered the association between aggression towards the self and aggression against others (Hillbrand, 1995). In a group of violent psychiatric inpatients, individuals with a history of both self-mutilation and suicidal behaviour exhibited significantly higher levels of aggression against others than individuals with a history of suicidal behaviour, a current self-mutilation group, and a control group who had not engaged in

suicidal or self-mutilative behaviour. These results suggested that a substantial proportion of violent individuals alternate between the display of aggression against the self and against others.

Although 85% of one sample of 240 self-mutilating females stated that they could never harm anyone else (Favazza & Conterio, 1989), individuals who self-mutilate generally have been described as aggressive and hostile (Grunebaum & Klerman, 1967; Pao, 1969; Simeon et al., 1992). Individuals who self-mutilate have evidenced higher scores on measures of irritability and hostility expressed either verbally or physically (Darche, 1990; Yesavage, 1983) and have exhibited overt hostility and impulsively aggressive behaviour (Graff & Mallin, 1967).

In comparison with a group of individuals who had self-poisoned, those who had engaged in self-mutilative behaviour were reported to more often have displayed violent behaviour towards others (Robinson & Duffy, 1989). Further research has demonstrated a lifetime history of greater aggression for personality disordered, self-mutilating individuals than for a non-mutilating control group diagnosed with personality disorder (Simeon et al., 1992). In this sample, degree of self-mutilation was positively correlated with chronic anger. The aggressive affect that was reported to precede self-mutilation was demonstrated to be a long-standing trait for these individuals and significantly differentiated the self-mutilation and control groups.

Researchers have suggested that aggression is one characteristic that distinguishes episodic and repetitive self-mutilation from compulsive self-mutilation (Favazza & Simeon, 1995). These authors noted that individuals who engage in compulsive self-mutilation generally do not demonstrate overt anger and that aggressive or sociopathic traits have not been associated with individuals who engage in this behaviour. Both compulsive and repetitive self-mutilation have been described as impulsive behaviours (Favazza & Simeon, 1995; Stein et al., 1995). Systematic comparison of these behaviours could delineate the processes associated with impulsive aggression and non-aggressive impulsiveness (Favazza & Simeon, 1995).

7.4 Impulsivity

The impulsive nature of self-mutilative behaviour consistently has been noted (Bennum, 1983; Evans, Platts & Liebenau, 1996; Favazza & Conterio, 1989; Gardner & Gardner, 1975; Graff & Mallin, 1967; Novotny, 1972; Pattison & Kahan, 1983; Simeon et al., 1992; Stanley et al., 1992). It has been suggested that individuals who self-mutilate have poor impulse control at times of extreme stress (Bennum, 1983). As distressing feelings escalate, the ability to control impulsive behaviour, such as self-mutilation, is reduced.

A lack of impulse control with regard to self-mutilation commonly has been reported. In one sample, 70% of self-mutilation participants reported little or no control over their self-mutilative

behaviour (Bennum, 1983). In another study, 78% of the 240 participants reported that they decided to self-mutilate on the spur of the moment and 15% made the decision to self-mutilate one hour prior to carrying out the act. Following this decision, self-mutilation was always (30%) or almost always carried out (51%) (Favazza & Conterio, 1989). In further research, the self-mutilative behaviour of 61% of the 54 participants was considered to be impulsive (Herpertz, 1995). Only 3 participants of another sample of 22 reported any struggle to resist the impulse to self-mutilate (Gardner & Gardner, 1975).

A significant positive correlation between the degree of self-mutilation and impulsivity has been noted (Simeon et al., 1992). Research has indicated that individuals who engage in deliberate self-harm (specific behaviours were not identified) are more impulsive than members of the general population (Evans et al., 1996). In addition, in this sample individuals who had a history of repetitive self-harm scored significantly higher on measures of impulsivity than a group who had been admitted to hospital for their first episode of self-harm. The authors suggested that although deliberate self-harm may be a response to a transient crisis, the factors associated with this behaviour are likely to be more enduring in people who engage in the behaviour repetitively.

Given that many individuals have reported feeling compelled to engage in self-mutilative behaviour and have reported feeling little control over the behaviour, classification of self-mutilation as a

disorder of impulse control has been suggested (Favazza & Rosenthal, 1993; Favazza & Simeon, 1995; Pattison & Kahan, 1983; Siomopoulos, 1974; Stein et al., 1993). Early researchers suggested that self-mutilation is best understood in the same class of behaviours as kleptomania and pyromania (Siomopoulos, 1974). Trichotillomania, a compulsive self-mutilative behaviour, has been classified in the DSM-III-R and the DSM-IV as a disorder of impulse control (American Psychiatric Association, 1987, 1994).

The essential feature of Impulse-Control Disorders Not Elsewhere Classified is the failure to resist an impulse, drive, or temptation to perform an act that is harmful to the person or to others. For most of the behaviours classified as impulse-control disorders, an increasing sense of tension or arousal is experienced prior to engaging in the behaviour, and, following the act the individual may experience feelings of regret, self-reproach, or guilt (APA, 1994). These features effectively can be applied to self-mutilation.

Indeed, researchers have contended that a repetitive self-mutilation syndrome should be regarded as an Axis I disorder of impulse control (Favazza, 1992; Favazza & Rosenthal, 1993). These authors proposed diagnostic criteria for a repetitive self-mutilation syndrome that was in adherence to the DSM format for a disorder of impulse control (Favazza & Rosenthal, 1993; Favazza & Simeon, 1995). These criteria were outlined in Chapter 3.

Individuals who self-mutilate have been reported to exhibit a range of impulsive behaviours in addition to their self-mutilation (Darche, 1990; Favazza & Rosenthal, 1993; Goldner, Cockhill, Bakan & Birmingham, 1991; Lacey & Evans, 1986; Langbehn & Pfohl, 1993; Novotny, 1972; Simpson, 1977; Zlotnick, Shea, Pearlstein, Simpson, Costello & Begin, 1996). Results of one study indicated that a history of multi-impulsive behaviours was the best predictor of self-mutilative behaviour (Zlotnick et al., 1996).

In one sample of 240 female self-mutilation participants 61% reported a history of disordered eating, most often bulimia (22%) (Favazza & Conterio, 1989). In addition, a substantial proportion of this sample reported problems with substance abuse. Eighteen percent of participants considered themselves alcoholics and 30% reported that they had used illicit substances. In other research, a significantly higher proportion of a self-mutilation group had been diagnosed with an eating disorder in comparison with a control group (Darche, 1990). In addition, a history of substance abuse was significantly more common for a self-mutilation sample than for a control group admitted to hospital for attempted suicide (Langbehn & Pfohl, 1993). Other impulsive behaviours, such as kleptomania, shop-lifting and sexual disinhibition have been reported to occur in conjunction with self-mutilation (Lacey & Evans, 1986).

It has been suggested that for some people, self-mutilative behaviour represents part of a multi-impulsive disorder (Favazza & Rosenthal, 1993; Lacey & Evans, 1986; Zlotnick et al., 1996). Research

has suggested that these individuals may oscillate between a range of impulsive behaviours with one (e.g., self-mutilation) being predominant at any given time. When one problem behaviour is addressed (e.g., alcohol abuse) it may be substituted with another (e.g., self-mutilation, bulimia) (Lacey & Evans, 1986). Anecdotal evidence has indicated that self-mutilation may be the most difficult of these behaviours to overcome (Favazza & Rosenthal, 1993).

7.5 Dissociation

Phenomenological reports have indicated that self-mutilation typically occurs in a state of dissociation or depersonalisation (Feldman, 1988; Graff & Mallin, 1967; Simpson, 1975; van Moffaert, 1990; Winchel & Stanley, 1991). Researchers have speculated that it is the depersonalised state that permits individuals to engage in painless self-mutilation (van Moffaert, 1990; Waltzer, 1968). In contrast, based on reported motives for engaging in the behaviour, it has been suggested that self-mutilation is used as a means of terminating uncomfortable feelings of depersonalisation (Favazza, 1987).

In one study, 22 of a sample of 24 individuals who self-mutilated described depersonalisation and feelings of unreality as preceding self-mutilation (Simpson, 1975). In this state, some individuals have reported a lack of direct awareness of self-mutilation (Simpson, 1976). It has been suggested that in this depersonalised state the individual experiences a marked decrease in

impulse control and is unable to resist the urge to self-mutilate (Pattison & Kahan, 1983; Waltzer, 1968).

Self-mutilation has been reported to occur in conjunction with dissociative disorders (Bliss, 1980; Coons, Bowman & Milstein, 1988; Coons & Milstein, 1990; Putnam, Guroff, Silberman, Barban & Post, 1986). In one study conducted at a dissociative disorders clinic, 48% of individuals diagnosed with dissociative identity disorder (DID), 28% with dissociative amnesia, and 23% diagnosed with a dissociative disorder not otherwise specified reported that they had engaged in self-mutilative behaviour (Coons & Milstein, 1990). Other research has demonstrated that a substantial proportion of people with DID (21-34%) self-mutilate (Bliss, 1980; Coons et al., 1988; Putnam et al., 1986).

An association between self-mutilative behaviour and dissociative symptoms has been indicated (van der Kolk, Perry & Herman, 1991; Zlotnick et al., 1996). In one study, higher ratings of dissociative symptoms were evident for females who reported experiencing no pain upon self-mutilation in comparison with a group who reported painful self-mutilation (Russ et al., 1993). In further research, significantly higher levels of dissociative symptoms were noted for self-mutilation participants than for an inpatient control group (Zlotnick et al., 1996). In addition, a significantly greater proportion of an inpatient self-mutilation group exhibited dissociative symptoms than a group who were admitted to hospital for attempted suicide (Langbehn & Pfohl, 1993). Although the

specific role of depersonalisation and dissociative symptoms in the act of self-mutilation remains unclear, research has indicated that dissociative symptoms are associated with self-mutilative behaviour (Zlotnick et al., 1996),

Two studies comparing individuals diagnosed with borderline personality with and without a history of self-mutilation have indicated no relationship between dissociative experiences and self-mutilation (Zweig-Frank et al., 1994a, 1994b). However, this research may have been limited by the author's use of a single item to assess self-mutilation (Zlotnick et al., 1996). The self-mutilation group were distinguished by their response to the question 'have you deliberately hurt yourself without trying to kill yourself in the past 2 years' (Zweig-Frank et al., 1994a, 1994b). The nature and extent of self-mutilative behaviour was not considered. It may be that transient dissociative symptoms are more prevalent in individuals who are currently engaging in self-mutilation. Alternatively, the presence of dissociative symptoms may be a reflection of the frequency or severity of self-mutilative behaviour.

7.6 Summary and conclusions

In summary, a variety of diagnoses have been applied to individuals who engage in self-mutilative behaviour and self-mutilation has been associated with a number of psychiatric disorders. Regardless of the diagnosis, research generally has elicited consistent results with regard to the range of symptoms that have

been reported to occur concomitantly with self-mutilative behaviour. However, some research has yielded contradictory results.

It is unclear whether the symptoms associated with self-mutilation are transient and evident only for the period that the individual is engaging in the behaviour, or whether they fluctuate in severity according to frequency of self-mutilation. It has been suggested that the symptoms associated with self-mutilation are representative of the individuals' longstanding affective traits (Herpertz, 1995). However, empirical support for this notion is somewhat limited. In order for self-mutilative behaviour to be managed effectively, it is important that the nature of the correlates of self-mutilation are clarified. The following chapter aims to address these issues.

CHAPTER 8

STUDY 2: SYMPTOMATOLOGY ASSOCIATED WITH SELF-MUTILATIVE BEHAVIOUR

8.1 INTRODUCTION

As detailed in Chapter 7, a variety of diagnoses have been applied to individuals who self-mutilate. However, regardless of the diagnosis and, as noted in Chapter 6, a range of unpleasant feelings have been associated with the act of self-mutilation itself. Researchers generally have agreed that depression, anxiety, hostility, dissociative symptoms and impulsiveness are associated with self-mutilative behaviour (Bennum, 1983; Darche, 1990; Favazza, 1992; Gardner & Gardner, 1975; Herpertz, 1995; Simeon et al., 1992; Zlotnick et al., 1996). Presently it is unclear whether these symptoms are transient and fluctuate in severity according to frequency of self-mutilation or whether they represent the individual's longstanding affective traits. Further research is required to clarify these issues.

The association between degree of psychological disturbance, negative life events and self-mutilation also is unclear. Researchers have considered the relationship between stressful life events and self-mutilative behaviour (Bennum, 1983; Carroll, Schaffer, Spensley & Abramowitz, 1981; Coid, Wilkins, Coid & Everitt, 1992; Simpson & Porter, 1981). In one study, self-mutilation participants reported significantly more short term negative life events and experiences of violence than psychiatric and non-patient control groups (Bennum, 1983). The experience of loss events (e.g., death, suicide, separation) did not significantly differentiate the clinical groups. Both self-mutilation and psychiatric control groups reported significantly more of these events than non-patient control participants. In order to

understand the process of self-mutilation it is important to identify the role of negative life events as well as the individuals' response to those events.

The association between self-mutilation and childhood sexual abuse has been particularly well documented (e.g., Favazza & Conterio, 1989; Grunebaum & Klerman, 1967; Schwartz et al., 1982). However, such a history is not common to all individuals who engage in the behaviour and this factor has not necessarily distinguished self-mutilation from control participants (e.g., Schwartz et al., 1989). Other research has indicated that, for some people, self-mutilation develops as a response to traumatic events such as rape in adulthood (Greenspan & Samuel, 1989). Self-mutilation also has been reported as a consequence of combat-related post traumatic stress disorder (PTSD) (Kim & Ainslie, 1990; Lyons, 1991; Pitman, 1990). However, not all individuals who are exposed to trauma necessarily engage in self-mutilation as a response to that trauma (Schwartz et al., 1989). Obviously there are factors other than exposure to negative life events that mediate self-mutilative behaviour.

As detailed in Chapter 5, most of the research regarding self-mutilation has been concerned with females who engage in the behaviour. Only a limited number of studies have considered the symptoms associated with self-mutilation of males who engage in the behaviour (e.g., Bach-y-Rita, 1974; Haines et al., 1995; Kaplan & Fik, 1977; Zweig-Frank et al., 1994b).

Researchers have noted that males engage in self-mutilation while intoxicated and feeling depressed (Kaplan & Fik, 1977). The self-mutilative behaviour of male prisoners has been associated with mild depression, restlessness and agitation (Bach-y-Rita, 1974). In further research, male self-mutilating prisoners demonstrated elevated scores on general measures of symptomatology as compared with prisoner and non-prisoner control participants (Haines et al., 1995). In particular, hostility and depression distinguished the self-mutilation from control participants. Direction of hostility did not distinguish the groups. For all participants, hostile feelings were directed towards other people. The authors suggested that self-mutilation did not represent aggression or rage towards the self in this sample (Haines et al., 1995).

Research regarding the symptoms associated with male self-mutilation generally has been conducted utilising incarcerated self-mutilation samples (e.g., Bach-y-Rita, 1974; Haines et al., 1995; Virkkunen, 1976). In one study a prisoner control group was utilised to ensure that symptoms were not associated with incarceration (Haines et al., 1995). It is important to determine whether results obtained using incarcerated male self-mutilation samples are generalisable to a broader population of males who engage in the behaviour.

A review of the literature has indicated that there has been no systematic comparison of the symptoms experienced by males and females who engage in self-mutilation. In separate studies, one

group of researchers investigated the psychological risk factors associated with male and female self-mutilative behaviour (Zweig-Frank et al., 1994a, 1994b). However, no direct comparison between male and female participants was made. In order to provide effective treatment for self-mutilative behaviour and its associated symptoms it is important to identify any differences in the symptomatology experienced by males and females who self-mutilate.

Self-mutilation has been interpreted as a marker of severity of particular disorders (Simeon et al., 1992). It would follow from this view that the need to engage in self-mutilative behaviour would be diminished if treatment of the disorder was undertaken and resolution of the symptomatology of that disorder was achieved. In other words, it would be expected that individuals who have a history of self-mutilation who are no longer engaging in the behaviour would evidence lower levels of symptomatology in comparison with individuals who are actively engaging in self-mutilative behaviour.

A review of the literature has indicated only one study that has investigated the differences in symptomatology experienced by individuals who were currently self-mutilating and those who were no longer engaging in the behaviour (McKerracher et al., 1968). Few significant differences were evident between individuals with a history of self-mutilation who had demonstrated no self-mutilative behaviour during the previous year (n = 8) and a group who had consistently engaged in the behaviour for that period (n = 13).

However, the results of this investigation were confounded by the small number of participants, and the fact that all participants were hospitalised for treatment of symptoms associated with psychotic disorders or intellectual disability.

It is proposed that identification of any alteration in the range of symptoms experienced by individuals who are no longer engaging in self-mutilation would provide information regarding the specific symptoms that are associated with performance of the behaviour. In addition, identification of any alteration in the type or degree of symptoms experienced by individuals with a history of self-mutilation who are no longer engaging in the behaviour would aid clinicians in the effective targeting of treatment interventions for those who are actively engaging in the behaviour.

Although behaviours such as self-mutilation may be a response to a transient crisis, the contributory factors are likely to be more enduring in individuals who repeat the behaviour (Evans et al., 1996). To date, systematic research regarding the development of a repetitive pattern of self-mutilation has been extremely limited.

Researchers have considered the factors that distinguish individuals presenting for their first episode of deliberate self-harm or parasuicide from those who repetitively have engaged in these behaviours (Buglass & Horton, 1974; Evans et al., 1996; Kreitman & Casey, 1988). Variables such as personality disorder, alcohol abuse, previous psychiatric contact, low socioeconomic status and criminal behaviour have been identified as risk factors associated with the

development of a repetitive pattern of parasuicidal behaviour (Buglass & Horton, 1974; Kreitman & Casey, 1988). In further research, individuals who engaged in repetitive deliberate self-harm were identified as more impulsive than individuals presenting for treatment of deliberate self-harm for the first time (Evans et al., 1996). It has been suggested that identification of enduring features such as specific personality traits that are associated with repetitive self-mutilation would aid in the early identification of individuals who are at risk of developing a repetitive pattern of self-mutilation (Evans et al., 1996).

Systematic research comparing the correlates of repetitive and infrequent self-mutilation has been extremely limited. One study examined the differences between individuals who engaged in frequent self-mutilation and those who had self-mutilated infrequently (fewer than 5 lifetime episodes) (Dulit et al., 1994). Scores on various measures of psychopathology indicated few differences between the groups. However, the frequent self-mutilation group did evidence significantly higher levels of suicidal ideation and were significantly more likely to have attempted suicide than the infrequent group. In this sample, all participants were hospitalised and had been diagnosed with borderline personality disorder. This selection bias may limit the generalisability of results to a broader population of people who self-mutilate.

There is evidence to suggest that individuals use self-mutilative behaviour as a means of coping with or gaining control

over unpleasant feelings (Favazza & Conterio, 1989; Simpson, 1975, 1976; Solomon & Farrand, 1996). Therefore, it makes sense to consider that individuals who repetitively self-mutilate would exhibit a greater number of symptoms or more severe symptoms than individuals who have only self-mutilated on a few occasions.

The aim of the present investigation was to clarify the association between the feelings that precede the self-mutilative act with the long standing affective traits associated with the behaviour. The symptoms presently experienced by individuals who were currently self-mutilating, those who were no longer self-mutilating and a control group with no psychiatric history or history of self-mutilative or suicidal behaviour were compared. It was expected that individuals who were currently engaging in the behaviour would report more severe psychological symptoms associated with self-mutilation than individuals who were no longer self-mutilating or control participants who had never engaged in the behaviour.

As outlined in Chapter 5, the self-mutilative behaviour of males and females traditionally has been considered to be phenomenologically different. Results of the first study in the present investigation demonstrated no appreciable differences in the nature and extent of self-mutilative behaviour between male and female participants. In the light of these results, there was no reason to expect that there would be any difference between males and females in terms of the symptoms associated with self-mutilation.

In order to investigate the factors associated with the development of a repetitive pattern of self-mutilation, a comparison of the symptomatology experienced by frequent and infrequent self-mutilation was made. It was hypothesised that the frequent group would exhibit more severe symptomatology than infrequent self-mutilation participants.

8.2 METHOD

8.2.1 Participants

Eighty-eight people participated in this investigation. Control participants (n = 42) were selected from the university psychology undergraduate programme and were matched to the original self-mutilation sample (n = 46) on the basis of age and sex.

8.2.2 Materials

An interview schedule devised by the author was used to record demographic information as well as data regarding psychiatric diagnosis, hospitalisation history and current medication status. Copies of this schedule and all unpublished scales used in this study are presented in Appendix D.

The Schedule of Recent Experience (Holmes & Rahe, 1967) was used as a control measure to determine if there were any differences between groups in terms of recent stressful life events. The schedule was designed to assess experiences over the past 12 months (Part A, items 1 to 12) as well as stressful events that have occurred over the

past 2 years (Part B, items 13 to 42). Items assessed change in experiences related to occupation, relationships, finance and social activity. Scores for each item were weighted according to severity and frequency of the stressful event and mean scores for each item summed to provide the total score. Total scores over 200 have been interpreted as sufficient for concern (Davis, Robbins-Eshelman & McKay, 1988).

A number of instruments were selected to assess the presence, nature and severity of symptomatology that has been associated with self-mutilative behaviour.

General symptomatology

The Symptom-Checklist-90-Revised (SCL-90-R; Derogatis, 1983) is a 90 item assessment of a range of psychological symptoms. The individual rates each of the 90 items on a 5 point scale according to the degree of distress experienced in the 7 days prior to test administration.

The SCL-90-R was designed to measure 9 psychiatric symptom dimensions: Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism. In addition, 3 global indices provide single scores of the nature and extent of psychopathology. The Global Severity Index (GSI) is a single summary score of the current level of psychopathology that is derived by combining information regarding the number of items endorsed and the degree of distress experienced

by the individual. The Positive Symptom Distress Index (PSDI) provides a measure of perceived distress that is separate from the number of items endorsed. The Positive Symptom Total (PST) provides a measure of the extent of symptomatology by scoring the number of items endorsed by the individual. Seven additional items that are not included in the primary symptom dimensions are included in the calculation of the global indices. The symptoms measured by these additional items are related to multiple symptom dimensions but are not exclusive to any one dimension.

Internal consistency of the 9 symptom dimensions has ranged from .77 for Psychoticism to .90 for the Depression subscale. This has indicated that symptom items do reflect the measurement dimension or underlying factor. In addition, test-retest reliability has ranged from .80 for the Anxiety subscale to .90 for Phobic Anxiety, indicating stability across time. Convergent and construct validation research has demonstrated that the SCL-90-R is a good measure of current psychopathology (Derogatis, 1983).

The SCL-90-R was designed to provide a measure of 'caseness'. A GSI or 2 or more dimension scores equal to or greater than a standard score of 63 have been considered to indicate a positive diagnosis or case (Derogatis, 1983).

Hopelessness

The Beck Hopelessness Scale (BHS; Beck, Weissman, Lester & Trexler, 1974) was designed to measure the overall severity of

negative future expectations. The scale consists of 20 true-false statements (scored 1 or 0) that assess the extent of pessimism regarding immediate and long term future prospects. Respondents are asked to rate how each statement describes their attitude for the past week. The 20 items consist of 11 positively and 9 negatively keyed statements with regard to current feelings of hopelessness. Item scores are summed to provide a total score ranging from 0 to 20. A higher score is indicative of greater feelings of hopelessness. Scores above 9 have been considered clinically significant (Beck & Steer, 1988).

Item total correlations ranging between .82 and .93 for different clinical populations have indicated that the BHS maintains high internal consistency. In addition, research has demonstrated good concurrent validity for the BHS (Beck et al., 1974). Scores on the BHS were significantly correlated with clinical ratings of hopelessness in two samples, outpatients in general medical practice (r = .74), and patients admitted to hospital for attempted suicide (r = .62). Test-retest reliability was indicated with correlations of .66 and .69 noted for 2 samples of participants tested at one week and six week intervals.

In addition, research has indicated that the BHS is a better predictor of suicidal intent than ratings of depression and it has been considered a powerful predictor of eventual suicide (Beck & Steer, 1988).

Anxiety

The Beck Anxiety Inventory (BAI; Beck, Epstein, Brown & Steer, 1988) was designed to measure the severity of current anxiety symptoms. Respondents are required to rate how much they have recently been affected by the anxiety symptoms listed in the 21 descriptive statements on a four point scale; (0) Not at all; (1) Mildly; (2) Moderately; and (3) Severely. Scores above 19 on the BAI have been interpreted as reflecting moderate to severe anxiety (Beck & Steer, 1990).

The BAI has been demonstrated to have high internal consistency with alpha coefficients ranging from .92 to .94 for different samples. In addition, item-total correlations have ranged from .30 to .71. Research has indicated that the BAI has good test-retest reliability. A correlation of .75 was derived for one sample who, prior to commencing treatment, completed the BAI at a one week interval (Beck & Steer, 1990). In addition, significant correlations between the BAI and other measures of anxiety have been demonstrated (Beck et al., 1988). Correlations ranging between .47 to .51 have been demonstrated for the BAI and measures of both self-reported and clinically rated anxiety (Beck & Steer, 1990).

The Trait Anxiety scale of the State Trait Anxiety Inventory (STAI Form Y-2; Spielberger, 1983) was used to assess enduring anxiety symptoms. The STAI T-Anxiety scale is comprised of 20 items that assess how people generally feel. Respondents are required to rate the frequency of anxious feelings on a four point

scale: (1) almost never; (2) sometimes; (3) often; (4) almost always. A rating of 4 is indicative of the presence of high anxiety for 11 items and depicts an absence of anxiety for 9 items. Scores are summed to provide a total score of trait anxiety. For the college student population in normative sample, mean scores of 38.3 and 40.4 were derived for males and females respectively (Spielberger, 1983).

Normative data have been derived for working adults, college students, high school students and military recruits. Alpha coefficients ranging from .89 for male military recruits to .91 for male and female working adults and female college students were indicated. Test-retest correlations for the T-Anxiety scale ranged from .70 to .77 for college and high school students indicating that this is a stable measure of trait anxiety. In addition, the T-Anxiety scale has been used to effectively discriminate between psychiatric patients and non-patient groups (Spielberger, 1983).

Depression

The Beck Depression Inventory (BDI; Beck, Rush, Shaw & Emery, 1979) was used to assess the nature and extent of depressive symptoms experienced by participants. The BDI consists of 21 groups of statements. Participants are required to respond on a 4 point scale according to which statement of each group best describes how they have been feeling for the past week including today. Scores above 19 on the BDI have been interpreted as a reflection of moderate to severe depression (Beck & Steer, 1993).

Research has indicated that the BDI has high internal consistency in both clinical and nonclinical populations. Alpha coefficients ranging from .79 to .90 have been reported (Beck & Steer, 1993). Research also has demonstrated that the BDI is able to effectively discriminate between patients with different psychiatric diagnoses as well as from non-psychiatric samples (Steer, Beck, Brown & Berchick, 1987; Steer, Beck, Riskind & Brown, 1986). In addition, the BDI has evidenced good concurrent validity with correlations between the BDI and clinically rated and self-reported assessments of depression ranging between .55 and .72 (Beck & Steer, 1993).

Dissociation

The Dissociative Experiences Scale (DES; Bernstein & Putnam, 1986) was included to determine the degree of dissociative symptoms experienced by participants. Dissociative experiences assessed by the scale include feelings of depersonalisation and derealisation, as well as disturbances in identity, memory, awareness and cognition. Although a distinction between derealisation, depersonalisation and dissociation can be made, the scale combines item scores to provide one total measure of dissociative experiences. A visual analogue format is used to represent respondents' scores on each of the 28 items. A total DES score is obtained from the mean of all item scores, ranging from 0 to 100. Data from the original sample indicated a median total DES score of 11 for a non-patient population.

Research has demonstrated that the DES has good internal reliability (Bernstein & Putnam, 1986; Ross, Joshi & Currie, 1990). Spilt-half reliability coefficients ranged from .71 to .96 for groups with different psychiatric diagnoses and a non-patient control group. Research has indicated that this scale is internally consistent and produces scores that are stable over time (Bernstein & Putnam, 1986). A test-retest reliability coefficient of .84 was evident for the original normative sample.

In addition, the DES has been demonstrated to have good construct validity with item scores correlating highly with the total scale score. The DES has been used to effectively differentiate between individuals with and without clinical diagnoses of a dissociative disorder (Bernstein & Putnam, 1986; Ross, Norton & Anderson, 1988) although it was designed for use as a screening tool, not a diagnostic instrument (Bernstein & Putnam, 1986).

Hostility

The Hostility and Direction of Hostility Questionnaire (HDHQ; Caine, Foulds & Hope, 1967) was utilised to assess the nature of hostile feelings in the present sample. Subscale scores were generated for Urge to Act Out Hostility, Self-Criticism, Criticism of Others, Paranoid or Projected Hostility, and Guilt. This scale provides a global hostility score as well as a measure of the direction of hostile feelings. A negative score for Direction of Hostility is

indicative of extrapunitive hostility, whereas a positive score reflects intropunitive hostile feelings.

Test-retest reliability coefficients for the original sample ranged from .23 for the Guilt subscale to .75 for the Total Hostility score. Comparison of the test-retest correlation coefficients for individuals who experienced successful treatment with those for whom treatment was unsuccessful has indicated support for the reliability of the test. At one year follow-up of those who reported treatment failure, coefficients ranged from .31 for the Self-Criticism subscale to .95 for Criticism of Others. For those for whom treatment was successful, coefficients ranged from .20 for Paranoid Hostility to .78 for Self-Criticism after one year (Caine et al., 1967).

Impulsivity

The Eysenck Impulsiveness Questionnaire (Eysenck & Eysenck, 1978) was used to determine the degree of impulsiveness for the 3 groups. Three subscale scores were derived from the 63 items of this questionnaire. The Venturesomeness subscale was designed to measure thrill and adventure seeking and risk taking tendencies, the Impulsiveness subscale was designed to assess disinhibition, non-planning and boredom susceptibility, and the Empathy subscale was included to determine individuals' emotional response to the perceived emotional experiences of others. Data from the original sample indicated mean scores of 10 for Impulsiveness and

Venturesomeness and a mean score of 13 for the Empathy subscale for normal participants (Eysenck & Eysenck, 1978).

Factor analysis demonstrated the distinctiveness of each of the three subscales. In addition, satisfactory alpha reliability coefficients were indicated for each subscale ranging from .64 for females for the Empathy subscale to .85 for males for the Impulsiveness subscale (Eysenck & Eysenck, 1978).

An Impulsive Behaviours Questionnaire developed by the author was utilised to investigate participants' history of multi-impulsive behaviour. This 19 item scale was based on the impulsive behaviours listed in the DSM-IV Impulse-Control Disorders Not Elsewhere Classified (APA, 1994). A score of 1 was awarded for each item endorsed. A higher score was considered to reflect a greater history of multi-impulsive behaviour.

Suicidal ideation/beliefs

The Reasons for Living Inventory (RFL-48; Linehan, Goodstein, Nielsen & Chiles, 1983) was utilised to identify the reasons for not engaging in suicidal behaviour that participants might access in times of crisis. This inventory has emphasised adaptive characteristics which may be lacking in the suicidal individual rather than identifying maladaptive characteristics. The 48 items of the inventory have been listed as reasons to not commit suicide. Participants were asked to rate how important these reasons would be to them if they were thinking about killing themselves.

Ratings were made on a 6 point scale ranging from 1 = not at all important as a reason, to 6 = an extremely important reason not to kill oneself. Average scores were elicited for the 6 subscales of the RFL. Three of the subscales were designed to assess positive factors concerned with reasons to continue living (Survival and Coping, Responsibility to Family, and Child Related Concerns). Other subscales were designed to measure specific negative expectations concerning the consequences of suicidal behaviour (Fear of Suicide, Fear of Social Disapproval and Moral Objections to Suicide).

Estimates of internal consistency were computed for each subscale separately. Alpha coefficients ranging from .72 to .89 indicated moderately high internal reliability for the subscales of the RFL-48. Significantly lower scores for the Survival and Coping Beliefs, Responsibility to Family, Child-Related Concerns, and Moral Objection subscales have effectively distinguished participants with a history of parasuicide from nonsuicidal psychiatric patients. In addition, significantly lower scores for the Survival and Coping scale, the Responsibility to Family, and Child Related Concerns scales distinguished participants with current suicidal ideation from nonsuicidal control participants. Research also has demonstrated that scores for the Survival and Coping and Responsibility to Family subscales correlated negatively with independent measures of depression (Linehan et al., 1983).

The Modified Scale for Suicide Ideation (MSSI; Miller et al., 1986) was administered to determine whether any differences in the

presence and extent of suicidal thoughts were evident between self-mutilation and control participants. This scale was described in Study 1.

8.2.3 Procedure

Questionnaires were completed verbally in the form of a structured interview at the university.

8.3 RESULTS

8.3.1 Overview

Initially, descriptive statistics were utilised to determine the diagnostic and medication characteristics of the total sample of participants.

Secondly, unpaired t-tests were employed to determine any significant differences in degree of symptomatology between male (n = 19) and female (n = 27) self-mutilation participants.

One factor analyses of variance (ANOVAs) were used to determine any differences in the level of symptomatology presently experienced by current (n = 21) and recovered (n = 25) self-mutilation participants and the control group (n = 42).

One factor ANOVAs also were employed to investigate any differences in symptomatology between a group who reported frequently engaging in the behaviour (n = 29), a group who had infrequently self-mutilated (n = 14) and control participants (n = 42).

8.3.2 Description of sample

The Schedule of Recent Experience (Holmes & Rahe, 1967) was used as a control measure to compare the number of stressful life events that recently had been experienced by self-mutilation and control participants. No significant difference between male and female self-mutilation participants was evident for this measure. In addition, no significant differences between current and recovered self-mutilation participants and the control group, or frequent self-mutilation, infrequent self-mutilation and control participants were demonstrated. Mean scores for all groups were over 350 on this scale indicating that a very high number of stressful life events had been experienced by all participants over the previous 2 years. Mean scores and standard deviations for the Schedule of Recent Experience are presented in Appendix E with the mean scores and standard deviations for other measures.

Of the total sample of self-mutilation participants, 33% had been diagnosed with a psychiatric disorder. Of these participants, 20% had received more than one diagnosis. Self-mutilation participants most commonly had been diagnosed with a depressive illness (66.7%) followed by anxiety disorder (20.0%), personality disorder (13.3%) and eating disorder (13.3%). One participant had been diagnosed with schizophrenia. His results were included in this analysis as he was not exhibiting florid symptoms at the time of the investigation and his self-mutilation was not in response to

disordered thoughts and perceptions. None of the control participants had been diagnosed with a psychiatric disorder.

Significantly more females than were statistically expected had been diagnosed with a psychiatric illness, χ^2 (1, N = 46) = 8.44, p < .01. Twelve of the 13 participants who had received a psychiatric diagnosis were female. Only one male had been diagnosed with a psychiatric disorder. There were no significant differences between current and recovered self-mutilation participants in terms of diagnosis. Significantly more participants in the frequent self-mutilation group had been diagnosed with a psychiatric disorder than were statistically expected, χ^2 (1, N = 43) = 5.25, p < .05. Twelve of the 13 participants who had received a psychiatric diagnosis had frequently self-mutilated. Only one infrequent self-mutilation participant had been diagnosed with a psychiatric disorder.

Of the total sample of self-mutilation participants, 35% were currently taking medication for the management of psychological symptoms. Of these, 31% were currently taking more than one kind of medication. Most commonly, participants had been prescribed antidepressant medication in the classes of selective serotonin reuptake inhibitors (37.5%) and monoamine oxidase inhibitors (31.3%). To a lesser extent, antianxiety agents (25%), antipsychotic agents (12.5%), sedatives and hypnotics (6.3%) and tricyclic antidepressant medication (6.3%) had been prescribed. Of these participants, 25% were taking other medication for the management of physical complaints. Participants had been taking medication for a

mean of 4 years (*SD* = 6.82 years, range = 2 weeks to 20 years). Only one control participant was currently taking medication which was prescribed for the management of a physical illness.

Significantly more females than were statistically expected were currently taking medication, χ^2 (1, N = 43) = 5.15, $p < .05$. Of the participants who were currently taking medication, 81% were female. Only 3 male self-mutilation participants (18.8%) had been prescribed medication. There were no significant differences between current and recovered self-mutilation in terms of current medication. Significantly more frequent self-mutilation participants than were statistically expected were presently taking medication, χ^2 (1, N = 43) = 3.88, $p < .05$. Of the participants who reported presently taking medication, 87% were frequent self-mutilation participants. Only 13% were from the infrequent self-mutilation group.

8.3.3 Symptomatology

Mean scores and standard deviations for current and recovered self-mutilation, frequent and infrequent self-mutilation, control participants, and male and female self-mutilation groups for each of the symptomatology measures are presented in Appendix E.

General symptomatology

There were no significant differences between male and female self-mutilation participants for subscale scores or global indices of the SCL-90-R.

Significant differences between current and recovered self-mutilation and control participants were evident for 8 of the 9 SCL-90-R subscales; Somatization, F (2, 86) = 5.86, $p < .004$; Obsessive-Compulsive, F (2, 86) = 6.59, $p < .002$; Interpersonal Sensitivity, F (2, 86) = 7.16, $p < .001$; Depression, F (2, 86) = 10.98, $p < .0001$; Anxiety, F (2, 86) = 6.31, $p < .003$; Phobic Anxiety, F (2, 86) = 13.06, $p < .0001$; Paranoid Ideation, F (2, 86) = 5.51, $p < .006$; and Psychoticism, F (2, 86) = 8.51, $p < .0004$. No significant between group differences were noted for the Hostility subscale. Figure 4 illustrates the variation between current and recovered self-mutilation groups and the control group for each subscale and the global indices of the SCL-90-R.

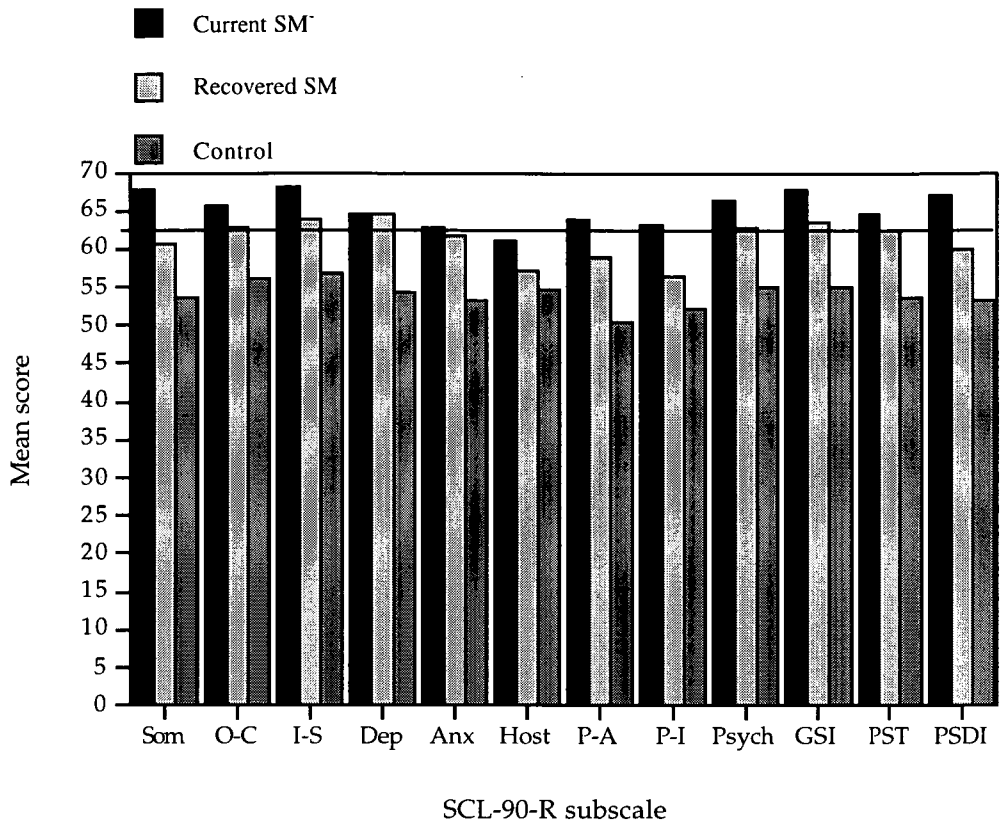


Figure 4. Mean scores for current, recovered and control groups for the subscales and global indices of the SCL-90-R.

Current self-mutilation participants scored significantly higher than the control group for the Somatization (Fisher LSD = 5.67, $p < .05$), Obsessive-Compulsive (Fisher LSD = 5.76, $p < .05$), Interpersonal Sensitivity (Fisher LSD = 6.22, $p < .05$), Depression (Fisher LSD = 5.93, $p < .05$), Anxiety (Fisher LSD = 6.36, $p < .05$), Phobic Anxiety (Fisher LSD = 5.48, $p < .05$), Paranoid Ideation (Fisher LSD = 6.50, $p < .05$) and Psychoticism subscales (Fisher LSD = 5.60, $p < .05$). In addition, the recovered self-mutilation group demonstrated significantly higher scores than control participants for Somatization (Fisher LSD = 5.27, $p < .05$), Obsessive-Compulsive (Fisher LSD = 5.36, $p < .05$), Interpersonal Sensitivity (Fisher LSD = 5.78, $p < .05$), Depression

(Fisher LSD = 5.14, $p < .05$), Anxiety (Fisher LSD = 5.91, $p < .05$), Phobic Anxiety (Fisher LSD = 5.10, $p < .05$) and Psychoticism (Fisher LSD = 5.53, $p < .05$). No significant differences between the current and recovered self-mutilation groups were demonstrated for any of the SCL-90-R subscales.

Examination of the global indices indicated significant between group differences for the GSI, F (2, 86) = 10.42, $p < .0001$. Significant differences were demonstrated between the current self-mutilation and control groups (Fisher LSD = 5.96, $p < .05$) and recovered self-mutilation and control participants (Fisher LSD = 5.53, $p < .05$). No significant difference between the GSI scores for current and recovered self-mutilation groups was demonstrated.

Significant between group differences were evident for the PST, F (2, 86) = 9.40, $p < .0002$. Current self-mutilation participants endorsed significantly more symptom items than control participants (Fisher LSD = 5.69, $p < .05$). Similarly, the recovered self-mutilation group reported more symptoms than the control group (Fisher LSD = 5.29, $p < .05$). No significant difference between the PST index score of current and recovered self-mutilation participants was demonstrated.

Significant between group differences were noted for the PSDI, F (2, 86) = 13.32, $p < .0001$. The mean PSDI for the control group was significantly lower than both the current (Fisher LSD = 5.36, $p < .05$) and the recovered self-mutilation groups (Fisher LSD = 4.99, $p < .05$). In addition, the current self-mutilation group reported significantly

higher levels of distress as measured by the PSDI than recovered self-mutilation participants (Fisher LSD = 5.92, $p < .05$).

Significant differences between frequent and infrequent self-mutilation and control participants were evident for 8 of the 9 SCL-90-R subscales; Somatization, F (2, 81) = 8.08, p <.001; Obsessive-Compulsive, F (2, 81) = 7.49, $p < .001$; Interpersonal Sensitivity, F (2, 81) = 7.27, $p < .01$; Depression, F (2, 81) = 13.41, $p < .0001$; Anxiety, F (2, 81) = 9.36, $p < .001$; Phobic Anxiety, F (2, 81) = 12.03, $p < .0001$; Paranoid Ideation, F (2, 81) = 5.52, $p < .01$; and Psychoticism, F (2, 81) = 9.91, $p < .0001$. No significant between group differences were noted for the Hostility subscale. Figure 5 illustrates the variation between frequent and infrequent self-mutilation groups and the control group for each subscale and the global indices of the SCL-90-R.

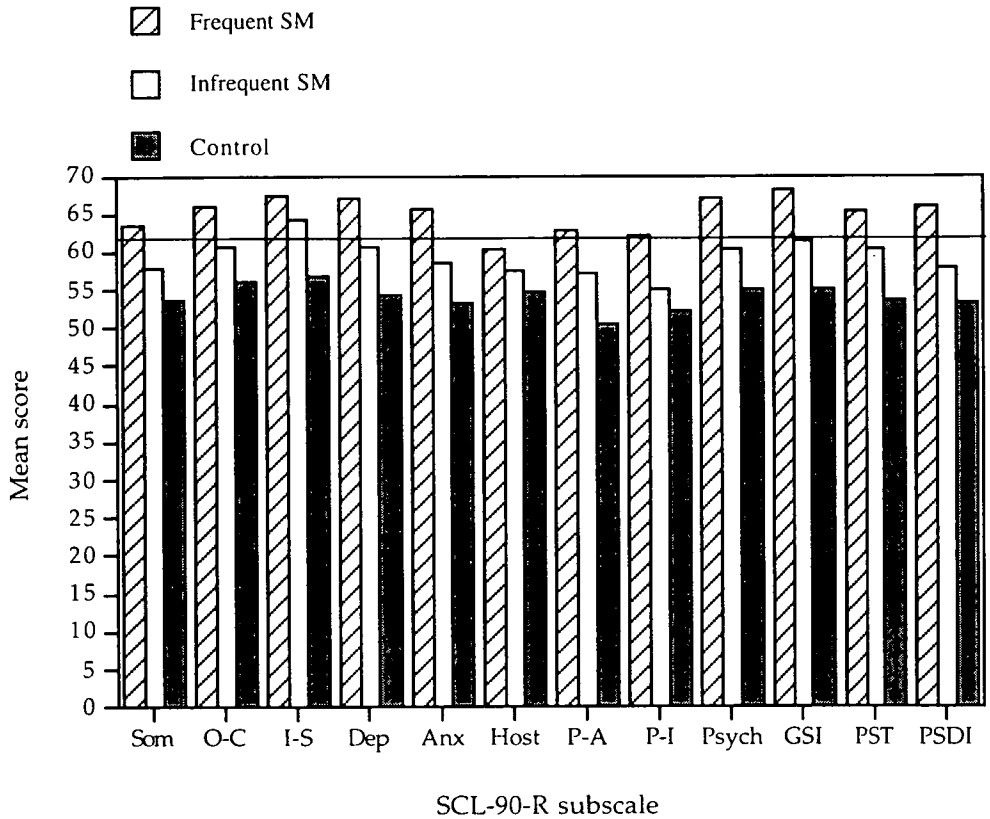


Figure 5. Mean scores for frequent and infrequent self-mutilation participants and the control group for the subscales and global indices of the SCL-90-R.

Frequent self-mutilation participants scored significantly higher than the control group for the Somatization (Fisher LSD = 4.92, $p < .05$), Obsessive-Compulsive (Fisher LSD = 5.19, $p < .05$), Interpersonal Sensitivity (Fisher LSD = 5.65, $p < .05$), Depression (Fisher LSD = 5.27, $p < .05$), Anxiety (Fisher LSD = 5.54, $p < .05$), Phobic Anxiety (Fisher LSD = 4.97, $p < .05$), Paranoid Ideation (Fisher LSD = 5.80, $p < .05$) and Psychoticism subscales (Fisher LSD = 5.35, $p < .05$). In addition, the infrequent self-mutilation group demonstrated significantly higher scores than control participants for Interpersonal Sensitivity (Fisher LSD = 7.15, $p < .05$), Depression (Fisher LSD = 6.66,

$p < .05$), and Phobic Anxiety (Fisher LSD = 6.29, $p < .05$). No significant differences between the frequent and infrequent self-mutilation groups were demonstrated for any of the SCL-90-R subscales.

Examination of the global indices indicated significant between group differences for the GSI, F (2, 81) = 11.70, $p < .0001$. Frequent self-mutilation participants demonstrated a significantly higher GSI than the control group (Fisher LSD = 5.35, $p < .05$). No significant difference between the GSI scores for the frequent and infrequent self-mutilation and the infrequent self-mutilation and control groups was demonstrated.

Significant between group differences were evident for the PST, F (2, 81) = 10.66, $p < .0001$. Frequent self-mutilation participants endorsed significantly more symptom items than control participants (Fisher LSD = 5.12, $p < .05$). Similarly, the infrequent self-mutilation group reported more symptoms than the control group (Fisher LSD = 6.47, $p < .05$). No significant difference between the PST index score of frequent and infrequent self-mutilation participants was evident.

Significant between group differences were noted for the PSDI, F (2, 81) = 13.60, $p < .0001$. The mean PSDI for the frequent self-mutilation group was significantly higher than both the infrequent self-mutilation (Fisher LSD = 6.47, $p < .05$) and the control group (Fisher LSD = 4.82, $p < .05$). No significant difference in level of distress as measured by the PSDI was demonstrated between the infrequent self-mutilation and control groups.

Hopelessness

No significant difference in mean BHS scores between male and female self-mutilation participants was demonstrated.

Mean scores for current and recovered self-mutilation participants, frequent and infrequent self-mutilation participants and the control group are illustrated in Figure 6.

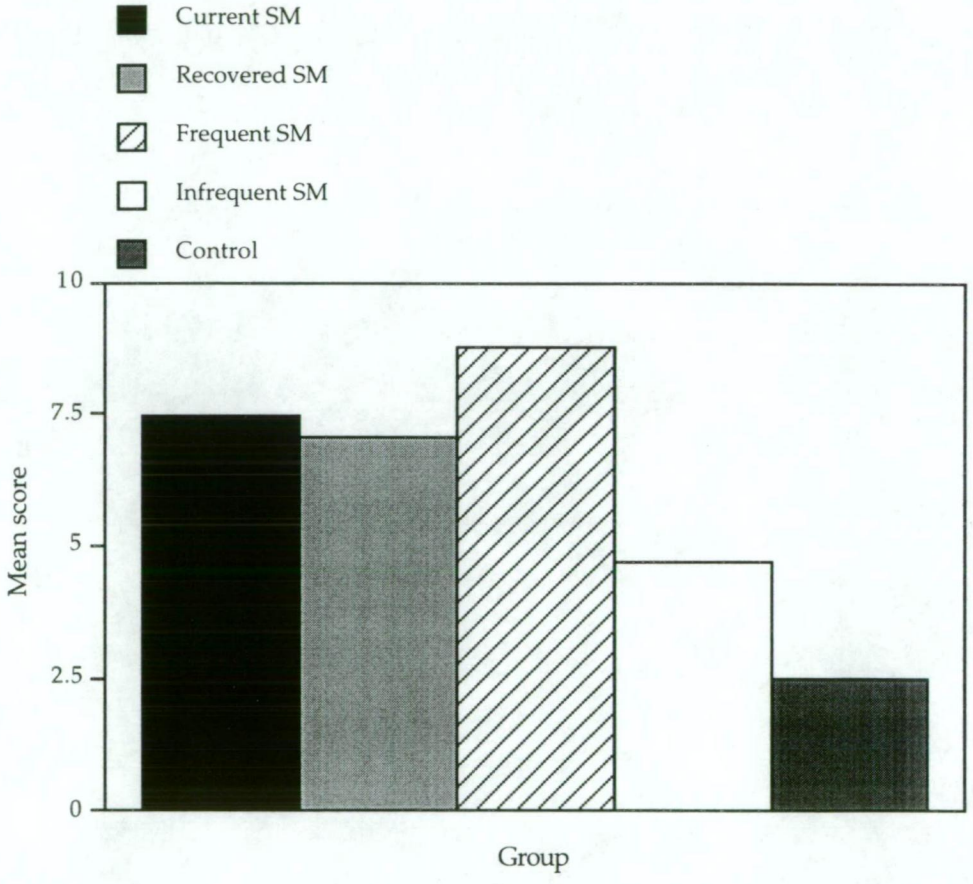


Figure 6. Mean scores for the Beck Hopelessness Scale for current, recovered, frequent, infrequent self-mutilation groups and the control group.

Significant differences between the current and recovered self-mutilation participants and the control group were noted for the BHS, F (2, 87) = 15.03, $p < .0001$. Post hoc analyses indicated that

current self-mutilation participants reported significantly higher levels of hopelessness than control participants (Fisher LSD = 2.16, $p < .05$). Similarly, recovered self-mutilation participants evidenced significantly higher ratings of hopelessness than the control group (Fisher LSD = 2.04, $p < .05$). No significant difference between the current and recovered self-mutilation groups was demonstrated for the BHS.

Significant differences between frequent and infrequent self-mutilation participants and the control group were evident for the BHS, F (2, 82) = 23.03, $p < .0001$. Post hoc analyses indicated that current self-mutilation participants reported significantly higher levels of hopelessness than infrequent self-mutilation (Fisher LSD = 2.49, $p < .05$) and control participants (Fisher LSD = 1.88, $p < .05$). No significant difference between the infrequent self-mutilation and control groups was demonstrated for the BHS.

Depression

No significant difference between male and female self-mutilation participants' BDI scores was demonstrated.

Mean scores for the BDI for current and recovered self-mutilation participants, frequent and infrequent self-mutilation participants and the control group are illustrated in Figure 7.

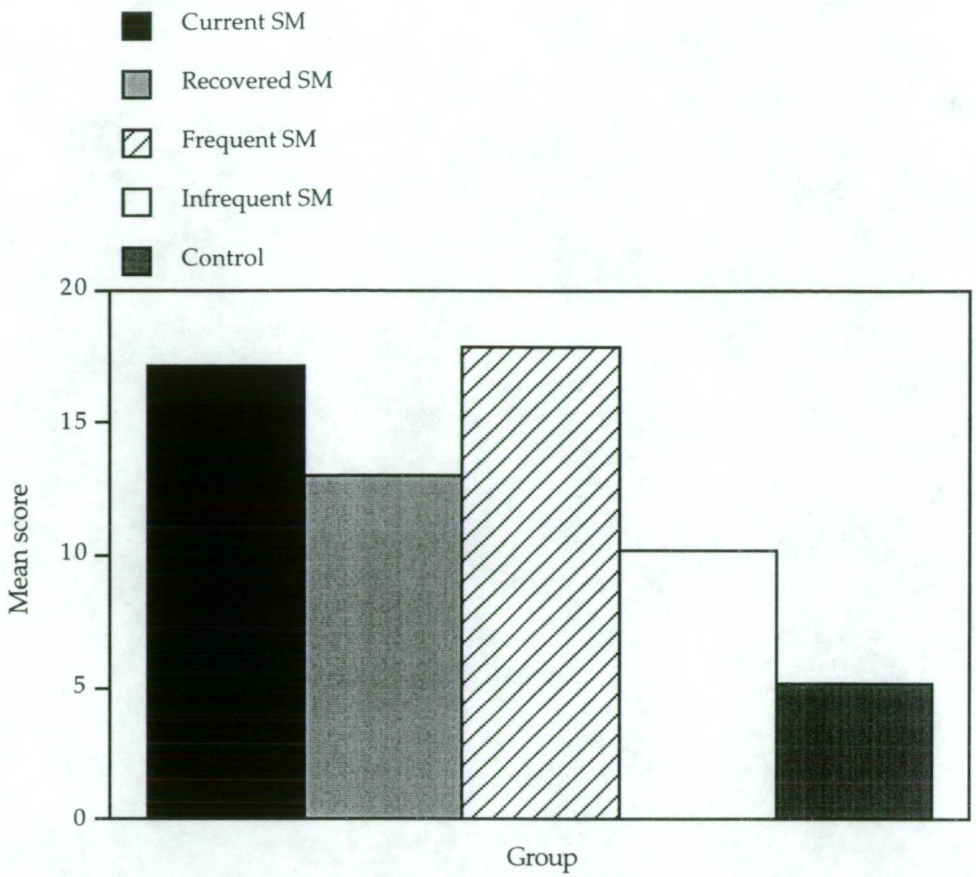


Figure 7. Mean scores for the Beck Depression Inventory for current, recovered, frequent and infrequent self-mutilation participants and the control group.

A significant variation between current, recovered and control groups' scores on the BDI was evident, F (2, 87) = 15.22, $p < .0001$. The current self-mutilation group scored significantly higher than the control group (Fisher LSD = 4.59, $p < .05$) and the recovered group scored significantly higher than the control group for the BDI (Fisher LSD = 4.34, $p < .05$). No significant difference in depressed feeling as measured by the BDI between current and recovered self-mutilation participants was evident.

Significant differences between frequent and infrequent self-mutilation participants and the control group were demonstrated for

the BDI, F (2, 82) = 19.21, $p < .0001$. The frequent self-mutilation group scored significantly higher than the infrequent group (Fisher LSD = 5.46, $p < .05$) and the control group (Fisher LSD = 4.05, $p < .05$). No significant difference between infrequent self-mutilation participants and the control group in depressed feeling as measured by the BDI was noted.

Anxiety

No significant difference between male and female self-mutilation participants' BAI scores was evident.

Mean scores for the BAI for current and recovered self-mutilation participants, frequent and infrequent self-mutilation participants and the control group are depicted in Figure 8.

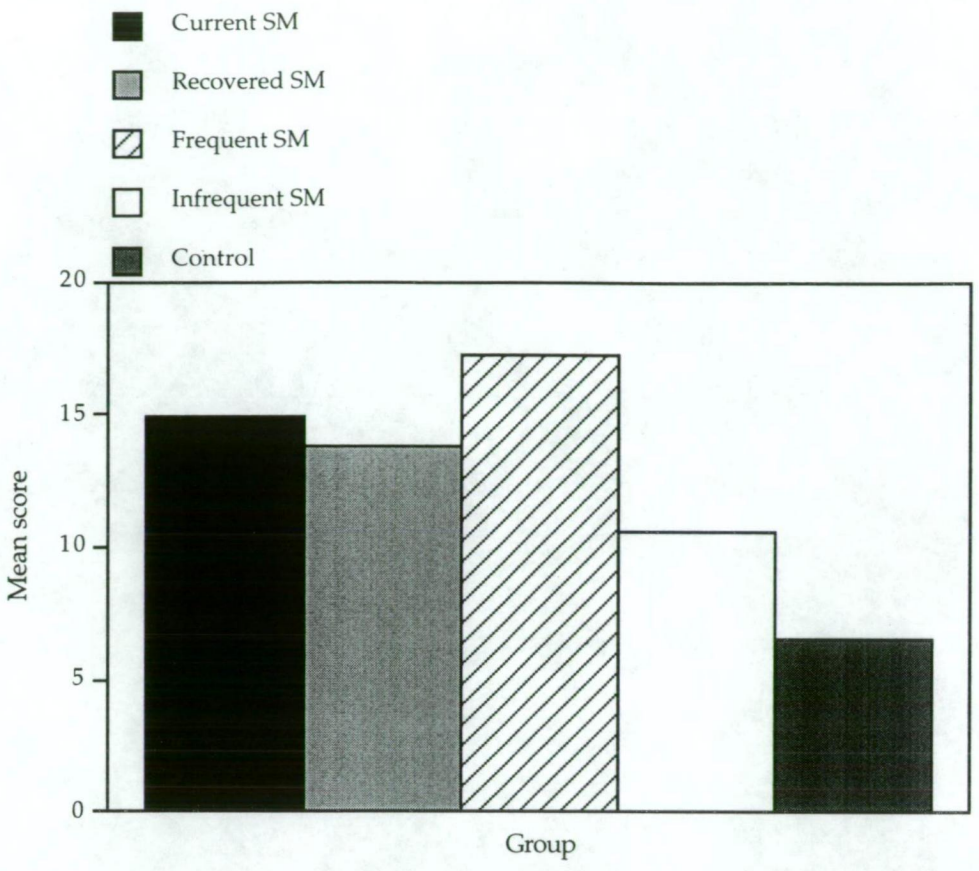


Figure 8. Mean scores for the Beck Anxiety Inventory for current, recovered, frequent and infrequent self-mutilation participants and the control group.

Significant differences between current and recovered self-mutilation participants and the control group for the BAI were evident, F (2, 87) = 8.03, $p < .001$. The current self-mutilation group reported significantly higher levels of anxiety than the control group (Fisher LSD = 4.87, $p < .05$). In addition, recovered self-mutilation participants scored significantly higher than control participants on the BAI (Fisher LSD = 4.61, $p < .05$). No significant differences between current and recovered self-mutilation participants were noted for scores on the BAI.

Significant differences between frequent and infrequent self-mutilation participants and the control group for the BAI also were demonstrated, F (2, 82) = 12.49, $p < .0001$. The frequent self-mutilation group reported significantly higher levels of anxiety than the infrequent self-mutilation (Fisher LSD = 5.72, $p < .05$) and control groups (Fisher LSD = 4.24, $p < .05$). No significant difference between infrequent self-mutilation participants and the control group were demonstrated for scores on the BAI.

No significant difference between male and female self-mutilation participants' STAI T-Anxiety scores was demonstrated.

Mean scores for the STAI T-Anxiety for current and recovered self-mutilation participants, frequent and infrequent self-mutilation participants and the control group are illustrated in Figure 9.

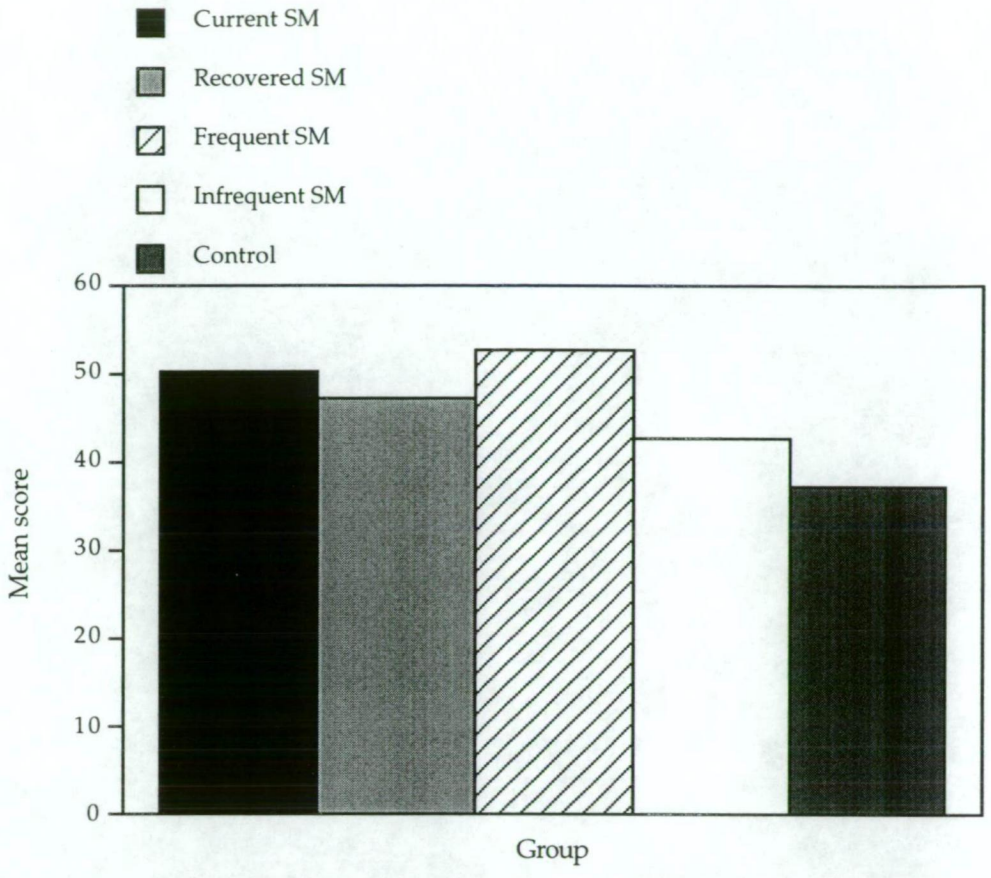


Figure 9. Mean scores for the State Trait Anxiety Inventory (T-Anxiety) for current, recovered, frequent and infrequent self-mutilation participants and the control group.

Significant differences between current and recovered self-mutilation and the control group were noted for a measure of trait anxiety, F (2, 86) = 12.87, $p < .0001$. Significant differences between current self-mutilation and control (Fisher LSD = 5.73, $p < .05$) and recovered self-mutilation and control groups (Fisher LSD = 5.41, $p < .05$) were noted for the STAI T-Anxiety. No differences between current and recovered self-mutilation groups were evident for this measure of trait anxiety.

Significant differences between frequent and infrequent self-mutilation participants and the control group were demonstrated for

a measure of trait anxiety, F (2, 81) = 19.15, $p < .0001$. Significant differences between frequent and infrequent self-mutilation (Fisher LSD = 6.61, $p < .05$) and frequent self-mutilation and control groups (Fisher LSD = 4.93, $p < .05$) were noted for the STAI T-Anxiety. No significant difference between the infrequent self-mutilation and control group was noted for this measure of trait anxiety.

Dissociation

No significant difference between DES scores for male and female self-mutilation participants was evident.

Mean scores for the DES for current and recovered self-mutilation participants, frequent and infrequent self-mutilation participants and the control group are illustrated in Figure 10.

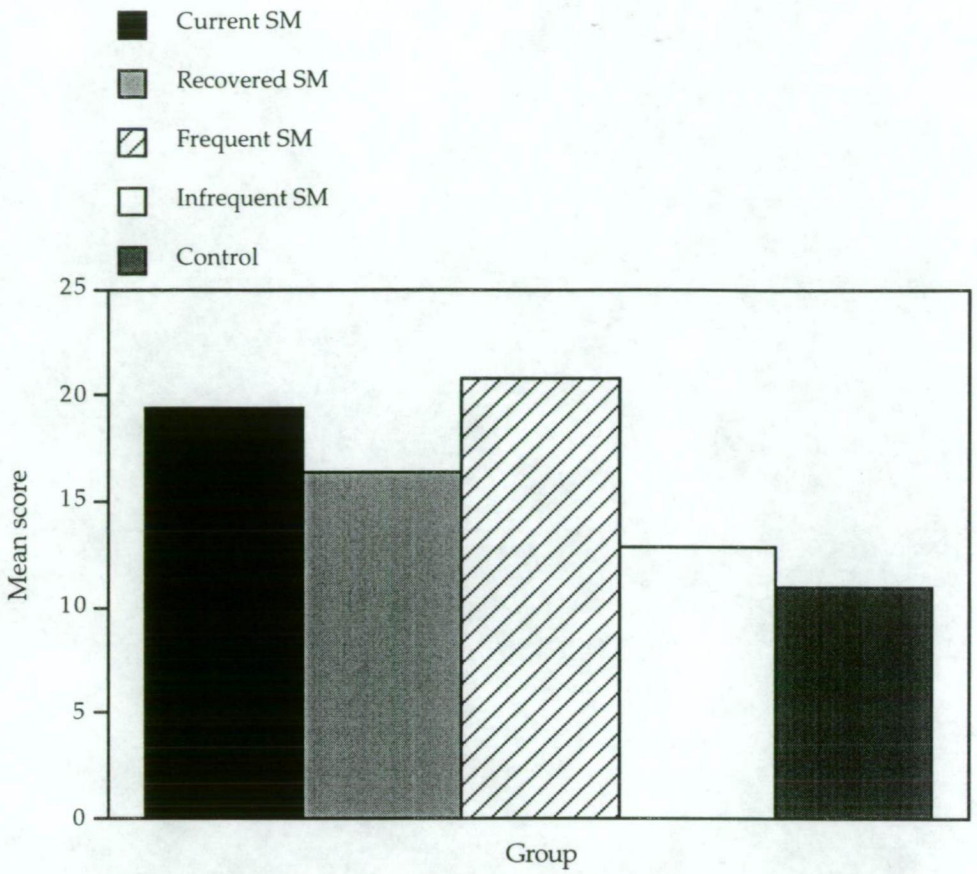


Figure 10. Mean scores for current, recovered, frequent and infrequent self-mutilation participants and the control group for the Dissociative Experiences Scale.

A significant variation between current and recovered self-mutilation and the control group for the DES was demonstrated, F (2, 85) = 4.00, $p < .05$. Current self-mutilation participants reported higher levels of dissociation than control participants (Fisher LSD = 6.30, $p < .05$). No significant differences in reported levels of dissociation as measured by the DES were noted between current and recovered self-mutilation participants or between the recovered self-mutilation and control groups.

Significant differences between frequent and infrequent self-mutilation and the control group were indicated for the DES, F (2, 80)

= 6.47, $p < .01$. Frequent self-mutilation participants reported higher levels of dissociation than infrequent self-mutilation (Fisher LSD = 7.54, $p < .05$) and control participants (Fisher LSD = 5.48, $p < .05$). No significant difference in reported levels of dissociation as measured by the DES was evident between infrequent self-mutilation participants and the control group.

Hostility

The HDHQ was used to compare the nature and extent of hostile feeling between the groups. No significant difference between male and female self-mutilation participants was evident for hostility.

Mean scores for the HDHQ for current, recovered, frequent and infrequent self-mutilation participants and the control group are illustrated in Figure 11.

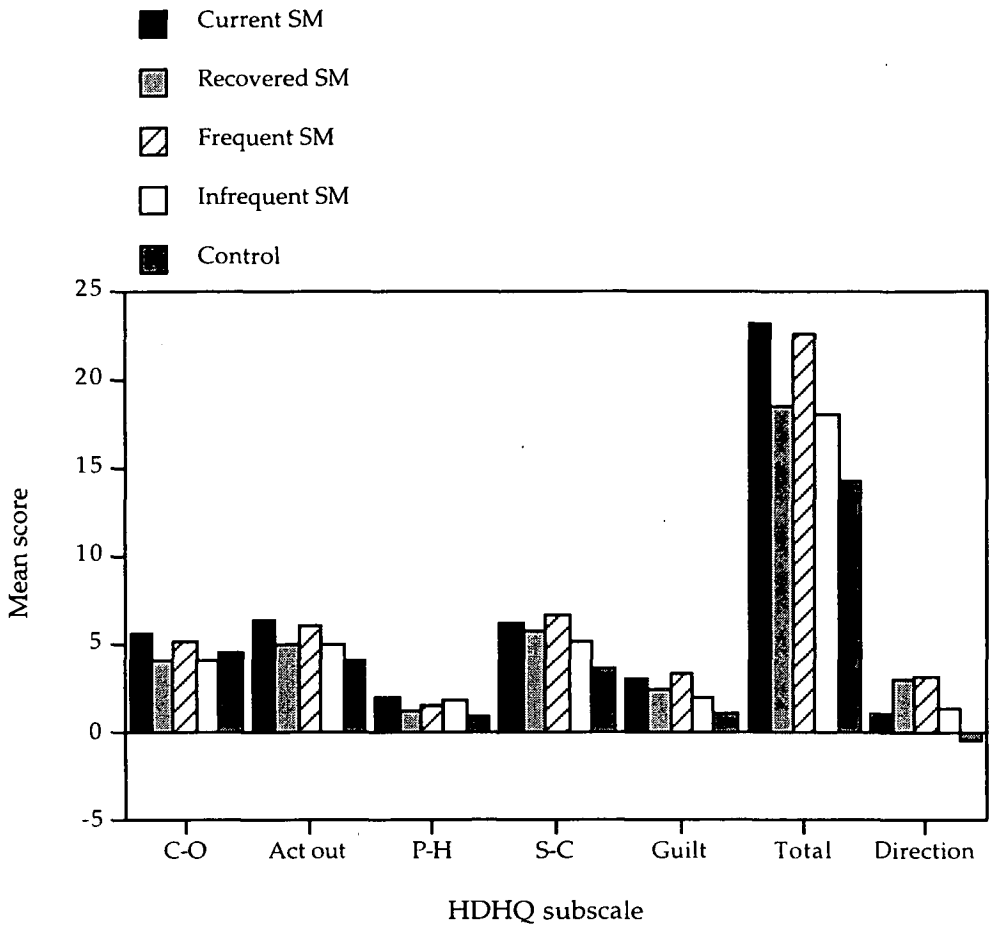


Figure 11. Mean scores for the current, recovered, frequent and infrequent self-mutilation participants and the control group for the Hostility and Direction of Hostility Questionnaire.

Significant differences in Total Hostility scores were evident between the current and recovered self-mutilation and the control group, F (2, 87) = 10.67, $p < .0001$. Current self-mutilation participants reported significantly higher levels of hostility than the recovered self-mutilation group (Fisher LSD = 4.29, $p < .05$) and the control group (Fisher LSD = 3.88, $p < .05$). The Total Hostility score for the recovered self-mutilation group was significantly higher than for the control group (Fisher LSD = 3.66, $p < .05$).

Significant differences between current self-mutilation, recovered self-mutilation and control participants were demonstrated for 3 of the 5 HDHQ subscales; Self-Criticism, F (2, 87) = 9.97, $p < .0001$; Guilt, F (2, 87) = 14.24, $p < .0001$; and Urge to Act Out Hostility, F (2, 87) = 8.23, $p < .0005$. No significant between group differences were evident for the Criticism of Others and Paranoid or Projected Hostility subscales.

Current self-mutilation participants scored significantly higher than control participants with regard to Self-Criticism (Fisher LSD = 1.28, $p < .05$), Guilt (Fisher LSD = 0.81, $p < .05$) and Urge to Act Out Hostility (Fisher LSD = 1.16, $p < .05$). Recovered self-mutilation participants scored significantly higher than control participants for Self-Criticism (Fisher LSD = 1.21, $p < .05$) and Guilt (Fisher LSD = 0.77, $p < .05$). Current self-mutilation participants scored significantly higher than recovered self-mutilation participants for Urge to Act Out Hostility (Fisher LSD = 1.28, $p < .05$).

No significant difference between the current and recovered self-mutilation participants and the control group in terms of Direction of Hostility was indicated.

Significant differences in Total Hostility scores were demonstrated between the frequent and infrequent self-mutilation and the control group, F (2, 82) = 10.75, $p < .0001$. Frequent self-mutilation participants reported significantly higher levels of hostility than the control group (Fisher LSD = 3.54, $p < .05$). No other

significant between group differences were evident for Total Hostility.

Significant differences between frequent self-mutilation, infrequent self-mutilation and control participants were demonstrated for 3 of the 5 HDHQ subscales; Self-Criticism, F (2, 82) = 13.23, $p < .0001$; Guilt, F (2, 82) = 22.27, $p < .0001$; and Urge to Act Out Hostility, F (2, 8) = 6.38, $p < .01$. No significant differences between frequent and infrequent self-mutilation participants and the control group were evident for the Criticism of Others and Paranoid or Projected Hostility subscales.

Frequent self-mutilation participants scored significantly higher than control participants with regard to Self-Criticism (Fisher LSD = 1.13, $p < .05$), Guilt (Fisher LSD = 0.68, $p < .05$) and Urge to Act Out Hostility (Fisher LSD = 1.08, $p < .05$). Infrequent self-mutilation participants scored significantly higher than control participants for Guilt (Fisher LSD = 0.87, $p < .05$). Frequent self-mutilation participants scored significantly higher than the infrequent group for Guilt (Fisher LSD = 0.92, $p < .05$).

No significant difference between the frequent and infrequent self-mutilation participants and the control group in terms of Direction of Hostility was indicated.

Impulsivity

No significant difference between male and female self-mutilation participants was evident for scores on the Impulsive Behaviours Questionnaire.

Mean scores for the Impulsive Behaviours Questionnaire for current, recovered, frequent and infrequent self-mutilation participants and the control group are illustrated in Figure 12.

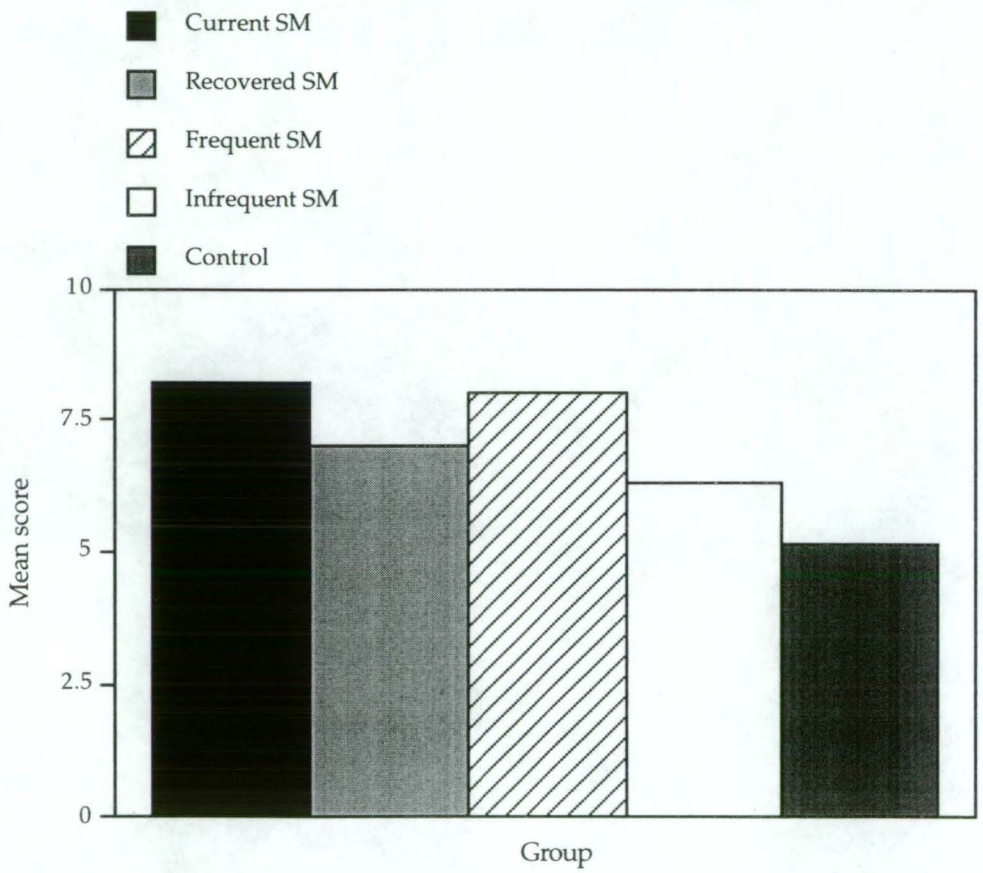


Figure 12. Mean scores for current, recovered, frequent and infrequent self-mutilation participants and the control group for the Impulsive Behaviours Questionnaire.

Results indicated significant differences between current and recovered self-mutilation groups and control participants on the Impulsive Behaviours Questionnaire, F (2, 73) = 4.51, $p < .05$. Post

hoc analyses demonstrated that current self-mutilation participants reported significantly higher levels of impulsive behaviour than control participants (Fisher LSD = 2.16, $p < .05$). No significant differences in the levels of impulsive behaviour were indicated between current and recovered self-mutilation participants, or between the recovered self-mutilation and control groups.

Significant differences between frequent and infrequent self-mutilation participants and the control group on the Impulsive Behaviours Questionnaire were noted, F (2, 71) = 4.88, $p < .05$. Post hoc analyses demonstrated that frequent self-mutilation participants reported significantly higher levels of impulsive behaviour than control participants (Fisher LSD = 7.82, $p < .05$). No significant differences in the levels of impulsive behaviour were indicated between frequent and infrequent self-mutilation participants, or between the infrequent self-mutilation and control groups.

Significant differences between male and female self-mutilation participants were demonstrated for 2 of the 3 subscales of the Eysenck Impulsiveness Questionnaire. Males scored significantly higher than females for the Venturesomeness subscale, t (37) = 3.27, $p < .001$; and females scored significantly higher than males for the Empathy subscale, t (37) = 2.83, $p < .01$.

In order to determine whether these differences were specific to individuals who self-mutilated, further analysis was conducted comparing male and female self-mutilation with control participants. Mean scores and standard deviations for each subscale

of the Eysenck Impulsiveness Questionnaire for male and female self-mutilation and control participants are presented in Appendix E. Mean scores for male and female self-mutilation and control participants for each of the subscales of this measure are illustrated in Figure 13.

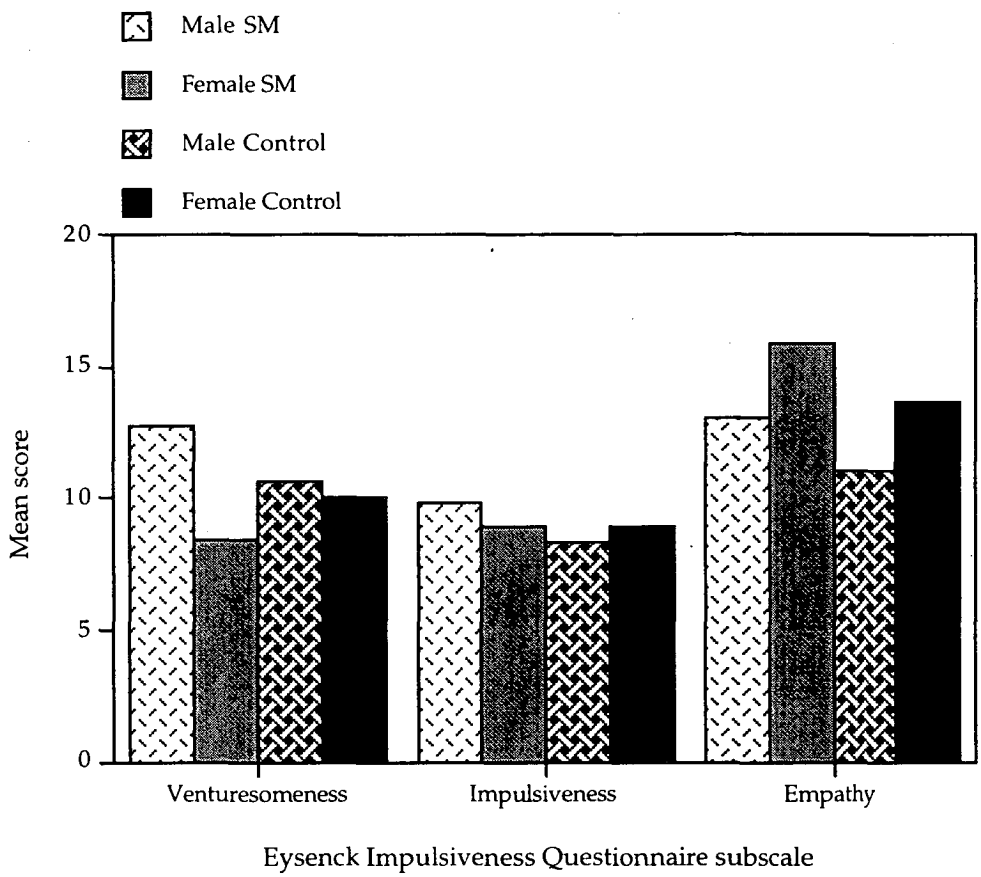


Figure 13. Mean scores for male and female self-mutilation and control participants for each subscale of the Eysenck Impulsiveness Questionnaire.

For Venturesomeness, a significant group (self-mutilation, control) x sex (male, female) interaction, F (1, 76) = 5.03, $p < .05$ was evident. Post hoc analyses indicated that this interaction could be accounted for by the pattern of difference between scores for males and females for the self-mutilation and control groups. There was

no significant difference between the Venturesomeness scores for male and female control participants. In addition, there was no significant difference between male self-mutilation and control participants, or female self-mutilation and control participants for the Venturesomeness subscale. As previously outlined, male self-mutilation participants scored significantly higher than female self-mutilation participants for this measure.

For the empathy subscale, no significant interaction for group (self-mutilation, control) and gender was demonstrated. However, a significant main effect was noted for both group, F (1, 76) = 11.24, $p <$ .001; and gender, F (1, 76) = 18.98, $p <$ .0001. Self-mutilation participants scored significantly higher for Empathy than control participants and the total sample of female participants scored significantly higher than the total sample of male participants for this subscale.

Mean scores for the Eysenck Impulsiveness Questionnaire for current, recovered, frequent and infrequent self-mutilation participants and the control group are depicted in Figure 14.

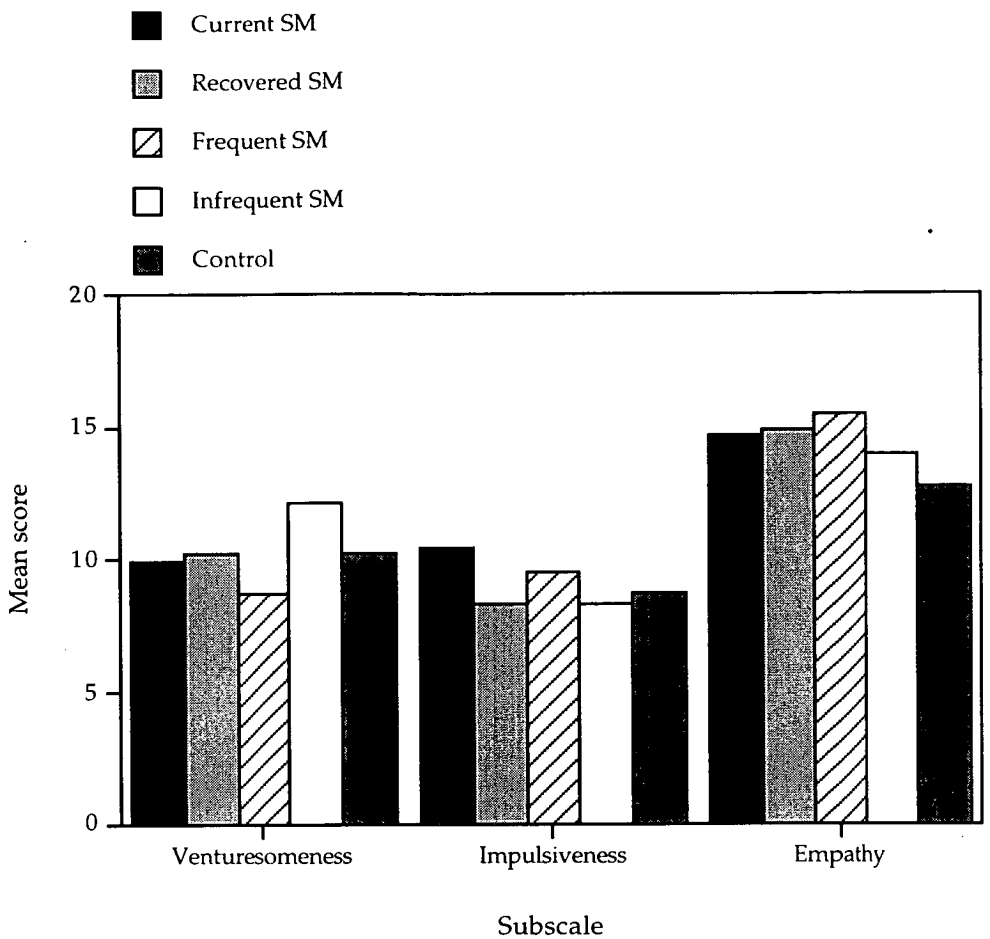


Figure 14. Mean scores for the current, recovered, frequent and infrequent self-mutilation participants and the control group for the Eysenck Impulsiveness Questionnaire.

A significant difference between current and recovered self-mutilation groups and control participants only was demonstrated for the Empathy subscale of the Eysenck Impulsiveness Questionnaire, F (2, 79) = 4.75, $p < .05$). Current self-mutilation participants scored significantly higher on measures of empathy than control participants (Fisher LSD = 1.72, $p < .05$) and recovered self-mutilation participants scored significantly higher than the control group on this subscale (Fisher LSD = 1.58, $p < .05$). No significant

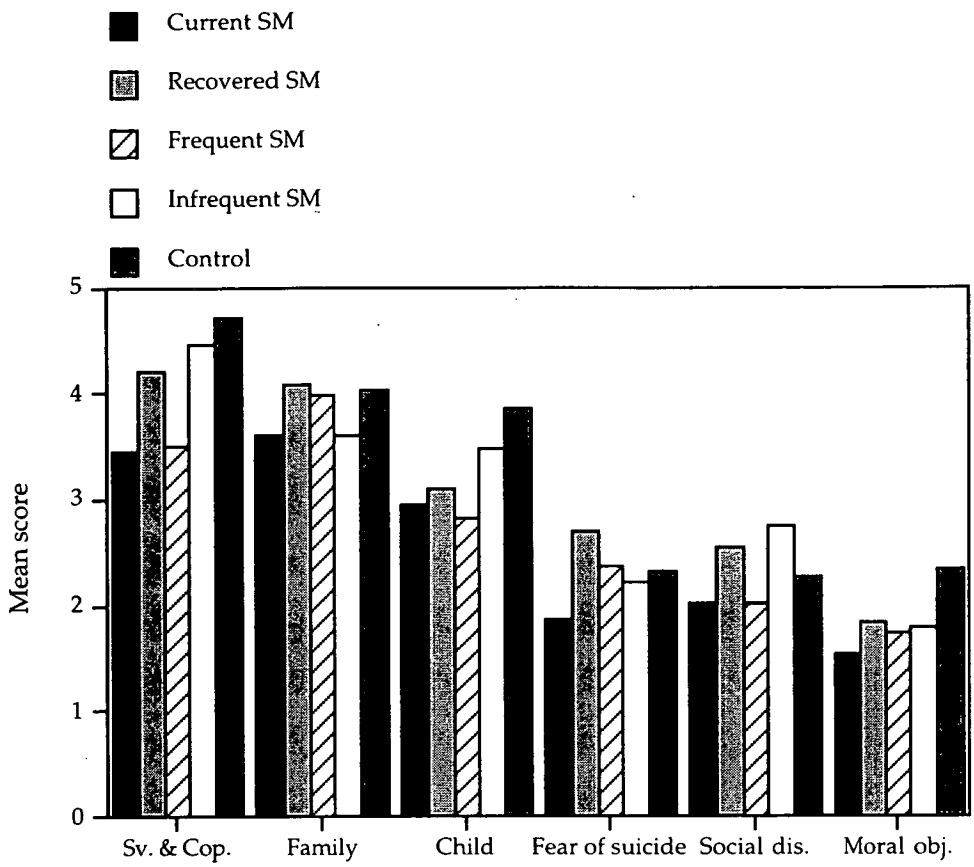
difference between the current and recovered self-mutilation participants was evident with regard to scores of Empathy.

Significant differences between frequent and infrequent self-mutilation groups and control participants were demonstrated for the Venturesomeness, F (2, 75) = 3.56, $p < .05$; and Empathy subscales of the Eysenck Impulsiveness Questionnaire, F (2, 75) = 6.58, $p < .01$). Infrequent self-mutilation participants scored significantly higher for Venturesomeness than the frequent self-mutilation group (Fisher LSD = 2.58, $p < .05$). Frequent self-mutilation participants scored significantly higher on the Empathy subscale than control participants (Fisher LSD = 1.49, $p < .05$). No other significant differences were noted for the Eysenck Impulsiveness Questionnaire.

Suicidal ideation/beliefs

The RFL-48 was used to determine any differences between the groups in beliefs related to suicide. No significant differences between male and female self-mutilation participants' RFL-48 scores were evident.

Mean scores for the RFL-48 for current and recovered self-mutilation participants, frequent and infrequent self-mutilation participants and the control group are depicted in Figure 15.



*Sv. & Cop. = Survival and Coping Beliefs
*Family = Family Related Concerns
*Child = Child Related Concerns
*Social dis. = Social Disapproval
*Moral obj. = Moral Objections Related to Suicide

Figure 15. Mean scores for the current and recovered self-mutilation and the control group for the Reasons for Living Inventory.

Significant differences between current and recovered self-mutilation participants and the control group were demonstrated for 3 of the RFL-48 subscales; Survival and Coping Beliefs, F (2, 84) = 12.29, $p < .0001$; Fear of Suicide, F (2, 84) = 3.96, $p < .05$; and Moral Objections related to suicide, F (2, 84) = 3.56, $p < .05$.

For the Survival and Coping Beliefs subscale, current self-mutilation participants scored significantly lower than the recovered

self-mutilation group (Fisher LSD = 0.55, $p < .05$) and the control group (Fisher LSD = 0.50, $p < .05$). The recovered self-mutilation group scored significantly lower than the control group with regard to this subscale (Fisher LSD = 0.47, $p < .05$).

The current self-mutilation group scored significantly lower than the recovered self-mutilation group for the Fear of Suicide subscale (Fisher LSD = 0.56, $p < .05$). No significant differences were demonstrated between the current and control, or recovered and control groups.

Current self-mutilation participants reported significantly lower scores than the control group for Moral Objections related to suicide (Fisher LSD = 0.64, $p < .05$). No significant differences between current and recovered self-mutilation, or the recovered self-mutilation and control groups were demonstrated for this measure.

Only one significant difference between frequent and infrequent self-mutilation participants and the control group was indicated for the RFL-48. A significant variation between groups was demonstrated for Survival and Coping Beliefs, F (2, 79) = 14.20, $p < .0001$. Frequent self-mutilation participants scores significantly lower than infrequent self-mutilation (Fisher LSD = 0.60, $p < .05$) and control participants (Fisher LSD = 0.45, $p < .05$). No significant differences between infrequent and control groups were noted for this measure.

Results regarding the MSSI for male and female self-mutilation were described in Chapter 5.

Mean scores for the MSSI for current and recovered self-mutilation participants, frequent and infrequent self-mutilation participants and the control group are depicted in Figure 16.

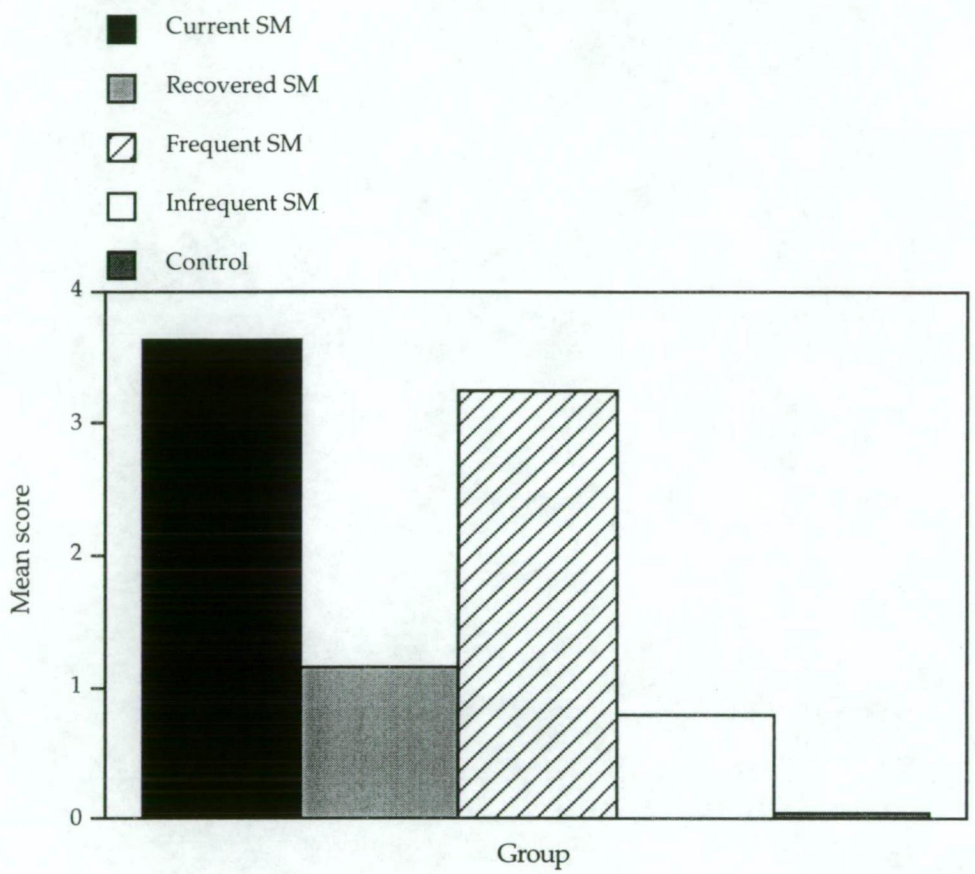


Figure 16. Mean scores for the current, recovered, frequent and infrequent self-mutilation participants and the control group for the Modified Scale for Suicidal Ideation.

Significant differences in levels of suicidal ideation as measured by the MSSI were demonstrated between the current and recovered self-mutilation and the control group, F (2, 87) = 4.37, $p <$ .05. Post hoc analyses indicated that current self-mutilation participants scored significantly higher than the control group (Fisher LSD = 2.40, $p < .05$). No other significant differences were evident.

A significant variation in MSSI scores also was demonstrated between frequent and infrequent self-mutilation participants and the control group, F (2, 82) = 4.23, $p < .05$). Frequent self-mutilation participants scored significantly higher than the control group (Fisher LSD = 2.21, $p < .05$). No other significant differences were noted.

8.4 DISCUSSION

8.4.1 Total sample

Self-mutilation has been described as an indicator of severe psychopathology (Simeon et al., 1992). As anticipated, individuals with a history of self-mutilation in this sample generally were more psychologically disturbed than people who had never engaged in the behaviour. The SCL-90-R was utilised to measure a range of psychological symptoms as well as to provide a general indication of psychological maladjustment.

Scores for the SCL-90-R for current, recovered and frequent self-mutilation groups were indicative of clinical 'caseness'. These participants scored above the cut-off for clinical significance for at least 2 subscales as well as evidencing GSI scores over 63 (Derogatis, 1983). Scores for current, recovered and frequent self-mutilation groups were significantly higher than the control group for all subscales of the SCL-90-R except the hostility subscale. The infrequent self-mutilation group scored significantly higher than control participants for 3 of the 9 SCL-90-R subscales and one of the global indices. However, infrequent self-mutilation participants did

not evidence significant psychological disturbance. None of the control group's subscale or global indices scores were indicative of the presence of psychological maladjustment.

No significant difference in the number or severity of stressful life events was noted between self-mutilation and control participants. In fact, mean scores indicated that a very high number of stressful life events had been experienced by all participants over the two years prior to this investigation. Therefore, the degree of symptomatology experienced by participants who self-mutilated cannot simply be attributed to the experience of negative life events.

The symptoms reported by self-mutilation participants in the present investigation generally were consistent with the range of symptoms that have been associated with self-mutilative behaviour (Bennum, 1983; Darche, 1990; Favazza, 1992; Gardner & Gardner, 1975; Herpertz, 1995; Simeon et al., 1992). Scores for current, recovered and frequent self-mutilation groups were significantly higher than the control group for measures of hopelessness, depression and anxiety. Self-mutilation participants' scores for these measures were indicative of a mild to moderate range of symptom severity.

Scores for depression, hopelessness and anxiety scales did not distinguish the infrequent self-mutilation and control participants. This aspect of the results will be discussed in more detail later. Scores for these measures demonstrated minimal symptomatology or negative feelings that were within a normal range of experience for

infrequent self-mutilation and control participants (Beck & Steer, 1988, 1990, 1993).

Degree of suicidal ideation only distinguished the current self-mutilation and frequent self-mutilation groups from control participants. However, as noted in the first study of this investigation, the full scale of the MSSI is only administered if scores are obtained on the first 4 screening items. It should be noted that the mean score for all groups were below 4 on this measure. The extremely low mean scores obtained for all groups indicated that administration of the full scale was rarely warranted and that suicidal ideation for all participants in this sample was minimal.

Researchers have emphasised the role of hostile feelings in self-mutilative behaviour (Bennum, 1983; Darche, 1990; Gardner & Gardner, 1975; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Pao, 1969; Raine, 1982; Roy, 1978; Simeon et al., 1992; Yesavage, 1983). Individuals who self-mutilate have demonstrated higher degrees of irritability, hostility and aggression than those who have never engaged in the behaviour (Bennum, 1983; Grunebaum & Klerman, 1967; Pao, 1969; Simeon et al., 1992).

Self-mutilation has been interpreted as an expression of aggression or hostility directed towards the self (Menninger, 1935; Raine, 1982). However, research has demonstrated that this is not necessarily the case (Bennum, 1983; Haines et al., 1995). Self-mutilation groups have evidenced significantly higher levels of extrapunitive hostility, particularly the urge to act out hostile

feelings, than control participants (Bennum, 1983; Haines et al., 1995). Both of these investigations were conducted using incarcerated self-mutilation samples. It is suggested that an elevated degree of extrapunitive hostility may be particular to this population of individuals who engage in the behaviour.

Results of the present investigation have supported the notion that there is an association between self-mutilative behaviour and hostile feelings. Although no significant difference between self-mutilation and control groups' scores on the hostility subscale of the SCL-90-R were demonstrated, self-mutilation participants exhibited significantly higher scores than the control group for a more extensive measure of hostility.

Although results indicated that self-mutilation participants direct hostile feelings towards themselves and control participants direct these feelings towards others, there was no significant difference between the mean scores for self-mutilation or control groups for direction of hostility as measured by the HDHQ. In addition, there were no significant differences between self-mutilation and control groups for measures of extrapunitive hostility indicating that this self-mutilation sample experienced a normal range of hostile feelings towards other people.

Results from the present investigation have supported the notion that self-mutilative behaviour is a reflection of hostile feelings towards the self. All self-mutilation participants scored significantly higher than control participants for the guilt subscale of

the HDHQ. Current, recovered and frequent self-mutilation participants also scored significantly higher than control participants for another measure of self-directed hostile feelings (self-criticism). Indeed, previous research has demonstrated an association between self-mutilation and low esteem or poor self-image (Johnson, 1978; Swift, Copeland & Hall, 1996).

Current self-mutilation participants scored significantly higher than the recovered self-mutilation and control groups and frequent self-mutilation participants scored significantly higher than the control group for a measure of the urge to act out hostility. These results have indicated that for individuals who self-mutilate the behaviour is mediated by the urge to act out this self-directed hostility, rather than any alteration in the nature of hostile feelings experienced.

Depersonalisation has been reported to precede the act of self-mutilation for a substantial proportion of people who engage in the behaviour (Feldman, 1988; Graff & Mallin, 1967; Simpson, 1975; van Moffaert, 1990; Winchel & Stanley, 1991). Research has yielded contradictory results with regard to the association between self-mutilation and dissociative symptoms. Some researchers have noted an association between self-mutilative behaviour and dissociative symptoms (Russ et al., 1993; Zlotnick et al., 1996). Others have found no correlation between dissociative experiences and self-mutilation (Zweig-Frank et al., 1994a, 1994b).

The mean DES score elicited for control participants in the present investigation was comparable to that derived in the normative sample (Bernstein & Putnam, 1986). Mean scores for current, recovered and frequent self-mutilation participants were above this estimate. However, only the mean score for current self-mutilation participants was significantly higher than the control group in the present study. No other significant between group differences were demonstrated for the DES.

Researchers have noted that the experience of depersonalisation preceding the act of self-mutilation is not universal (Simpson, 1975). Indeed, research has indicated that there may not be a simple association between dissociative symptoms and self-mutilative behaviour. Rather, it seems that dissociation may influence factors such as the experience of pain when self-mutilating which varies between individuals who engage in the behaviour (Russ et al., 1993). Results elicited in the present investigation may reflect the variation in the experience of dissociative symptoms between people who engage in self-mutilative behaviour.

The impulsive nature of self-mutilation has been emphasised (Bennum, 1983; Favazza & Conterio, 1989; Gardner & Gardner, 1975; Graff & Mallin, 1967; Novotny, 1972; Pattison & Kahan, 1983; Simeon et al., 1992; Stanley et al., 1992). However, research regarding impulsiveness as an enduring trait of individuals who self-mutilate has been limited.

Results of previous research have indicated that poor impulse control combined with aggression is associated with self-mutilative behaviour (Simeon et al., 1992). Results of the present investigation provide some support for this notion. No significant differences in impulsiveness between self-mutilation and control participants were demonstrated in the present sample. It is suggested that the impulsiveness associated with self-mutilation may be situation specific rather than reflecting an enduring personality trait. The experience of dissociative symptoms combined with an urge to act out hostile feelings directed towards the self may limit the individual's ability to control the impulse to self-mutilate when distressing feelings escalate.

Current, recovered and frequent self-mutilation participants evidenced significantly higher scores for the Empathy subscale of the Eysenck Impulsiveness Questionnaire than the control group. These results have indicated that individuals with a history of self-mutilation are particularly sensitive in terms of sharing or being affected by the perceived emotional experience of others.

Indeed, researchers have described individuals who self-mutilate as emotionally labile (Grunebaum & Klerman, 1967; Simpson, 1975, 1976) and it has been suggested that poor affect regulation is the underlying psychopathological dimension of self-mutilation (Zweig-Frank et al., 1994a). Results of the present study have indicated that individuals who self-mutilate may have a tendency to overreact to negative events they experience directly, or

to the perceived negative experiences of others. Escalating feelings of distress may result from this oversensitivity and lead to the urge to act out this distress in the form of self-mutilation.

Research has indicated that a proportion of individuals who self-mutilate exhibit a range of additional impulsive behaviours (Favazza & Rosenthal, 1993; Lacey & Evans, 1986; Zlotnick et al., 1996). It has been suggested that self-mutilation is used interchangeably with these behaviours (Lacey & Evans, 1986; Zlotnick et al., 1996). It was anticipated that participants with a history of self-mutilation would report having engaged in a greater number of impulsive behaviours than the control group.

History of impulsive behaviour distinguished only the current and frequent self-mutilation groups from the control group. In addition, there were no significant differences between frequent and infrequent self-mutilation and current and recovered self-mutilation groups for this measure. These results have demonstrated that a proportion of people who self-mutilate engage in impulsive behaviours in addition to or as a substitute for self-mutilation and have provided some support for the notion that self-mutilation represents part of a multi-impulsive behavioural phenomenon (Favazza & Rosenthal, 1993; Lacey & Evans, 1986; Zlotnick et al., 1996).

8.4.2 Symptomatology of current and recovered self-mutilation participants

In the present study, it was postulated that the need to engage in self-mutilation would be diminished if the unpleasant emotional symptoms associated with the behaviour were controlled. Therefore, it was hypothesised that individuals who were currently self-mutilating would exhibit significantly higher levels of symptomatology than those who were no longer engaging in the behaviour.

The results of this investigation were unexpected. It was evident that the symptoms associated with the behaviour persisted even when self-mutilation was no longer part of an individual's behavioural repertoire. No significant differences between current and recovered self-mutilation groups were evident for any of the SCL-90-R subscales, the general severity of symptoms assessed by these subscales or the total number of symptoms reported. In addition, no significant differences between current and recovered self-mutilation participants were apparent for measures of hopelessness, depression, recent feelings of anxiety as assessed by the BAI, trait anxiety, dissociation, impulsiveness or suicidal ideation.

It was of some interest that although no differences between current and recovered self-mutilation groups were demonstrated for the number or severity of symptoms reported, current self-mutilation participants evidenced significantly higher levels of distress regarding the presence of these symptoms. Mean PSDI for

the SCL-90-R reached a level indicating clinical significance for the current self-mutilation group only.

A few other factors distinguished the current and recovered self-mutilation groups. The current group evidenced significantly greater feelings of hostility, particularly the urge to act out hostile feelings. In addition, with regard to suicide related thoughts they were significantly less fearful of the suicidal act than the recovered group. Current self-mutilation participants were significantly less able than the recovered group to generate survival and coping ideas related to suicide as measured by the RFL-48.

These results have suggested that it was the level of distress experienced by the current self-mutilation group that made it difficult to control the urge to act out these feelings of distress in the form of self-mutilation. The fact that current self-mutilation participants were less able to generate coping ideas related to suicide than the recovered group suggests that individuals with a history of self-mutilation may not necessarily be deficient in these kinds of coping skills. Indeed, previous research has supported this notion. Research investigating the coping skills of an incarcerated self-mutilation sample demonstrated that these individuals were not lacking in effective coping strategies (Haines & Williams, 1997). However, individuals who self-mutilate may be unable to access these skills effectively when distressed.

There were no differences between current and recovered self-mutilation groups in terms of help seeking behaviour, current

medication, history of self-mutilation or recent negative experiences that could account for the alteration in distress related symptoms associated with current self-mutilation. Results have indicated that self-mutilative behaviour may be mediated by distress regarding the presence of unpleasant symptoms rather than the symptoms themselves. However, the factors that alter the level of distress experienced by people who self-mutilate remain unclear.

8.4.3 Sex differences in symptomatology associated with self-mutilation

As outlined in Chapter 5, it has been suggested that there are phenomenological differences in the self-mutilative behaviour of males and females (Gardner & Gardner, 1975; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Rosenthal et al., 1972). It would follow from this suggestion that there would be substantial differences in the type or degree of symptoms reported by males and females who engage in self-mutilative behaviour. The first study in this investigation demonstrated no substantial differences in the nature and extent of self-mutilation between males and females who engage in the behaviour. Therefore, in the present study, no significant differences in the type or degree of symptoms associated with self-mutilation were anticipated.

Significantly more females than males in the present sample had been diagnosed with a psychiatric illness. Rather than reflecting a gender difference in the type or severity of symptoms associated

with self-mutilation, it is likely that this result reflects the more frequent help seeking behaviour of females who self-mutilate than previously has been outlined. Results of the present study have evidenced no significant difference in the range of symptoms reported by male and female self-mutilation participants and no significant differences in the degree of symptomatology they had experienced.

Notable gender differences were demonstrated for the subscales of one measure. Male self-mutilation participants scored significantly higher than females for the Venturesomeness subscale and females scored significantly higher than male self-mutilation participants for the Empathy subscale of the Eysenck Impulsiveness Questionnaire.

Further analysis demonstrated a variation in the pattern of difference in Venturesomeness between males and females for self-mutilation and control groups. Male self-mutilation participants demonstrated an elevated Venturesomeness score in comparison with female self-mutilation participants. However, there was no difference between male self-mutilation and male control, and female self-mutilation and female control participants for this measure. Venturesomeness scores for male and female self-mutilation and control participants were all within normal range experience (Eysenck & Eysenck, 1978).

Research has indicated that females generally are more empathic than males (Fox, Gibbs & Auerbach, 1985; Hanson &

Mullis, 1985; Whitehead & Nokes, 1990). In addition, research has demonstrated that females are more introspective and self-focused than males and that this increased self-focused attention is associated with the experience of greater emotional distress following negative events (Ingram, Cruet, Johnson & Wisnicki, 1988). Results of the present investigation have supported this notion. Analysis incorporating both self-mutilation and control participants demonstrated that females generally scored significantly higher on the measure of empathy than male participants.

Results of the present investigation have indicated that the differences between males and females for Venturesomeness and Empathy were not associated with the psychiatric symptomatology experienced by males and females who self-mutilate. Rather, they may be associated with some variation between the sexes in motivations for engaging in the behaviour.

8.4.4 Symptoms associated with repetitive self-mutilation

The literature has indicated that individuals use self-mutilative behaviour as a means of coping with or gaining control over negative feelings (Favazza & Conterio, 1989; Simpson, 1975, 1976; Solomon & Farrand, 1996) and that self-mutilation is a marker of severe psychopathology (Simeon et al., 1992). Following from this, it was hypothesised that individuals who frequently engaged in self-mutilative behaviour would exhibit a greater number of psychological symptoms or more severe symptomatology than

individuals who had infrequently self-mutilated. Results supported this hypothesis.

The frequent self-mutilation group reported significantly greater feelings of hopelessness, depression, dissociation and anxiety (including trait anxiety) than both infrequent self-mutilation participants and the control group. There were no significant differences between infrequent self-mutilation and control participants for these measures. In addition, significantly more frequent than infrequent self-mutilation participants had been diagnosed with a psychiatric illness.

However, results demonstrated that the infrequent self-mutilation group were not symptom free. There were no significant differences between frequent and infrequent self-mutilation participants for any of the SCL-90-R subscales. In addition, there was no significant difference between frequent and infrequent self-mutilation groups for degree of psychological maladjustment as measured by the GSI or total number of symptoms reported. However, frequent self-mutilation participants reported feeling significantly more distressed than the infrequent group regarding the presence of psychological symptoms. This result has suggested that the distress associated with the presence of unpleasant symptoms contributes to the development of a repetitive pattern of self-mutilative behaviour.

Frequent self-mutilation participants scored significantly higher than control participants for self-criticism, guilt, and the urge

to act out hostile feelings. Only scores for the guilt subscale distinguished frequent and infrequent self-mutilation groups. Frequent self-mutilation participants reported significantly more feelings of guilt than infrequent self-mutilation participants. In addition, infrequent self-mutilation participants reported a significantly higher degree of guilt than the control group. These results have suggested that a repetitive pattern of self-mutilation may not be mediated by hostility.

Results of the present investigation also have demonstrated that severity of dissociative symptoms is associated with frequency of self-mutilative behaviour. The frequent self-mutilation group reported a significantly higher degree of dissociative symptoms than those who had infrequently engaged in the behaviour and control participants. There was no significant difference in DES scores between infrequent self-mutilation and control groups, indicating that infrequent self-mutilation participants experienced dissociative symptoms within a normal realm of experience.

Researchers have suggested that in the depersonalised state individuals experience a marked decrease in impulse control and are unable to resist the urge to self-mutilate (Pattison & Kahan, 1983; Waltzer, 1968). Theoretically, the higher the frequency and severity of dissociative experiences, the greater the opportunity for self-mutilation to develop into a habitual behaviour.

Research has indicated that impulsiveness may be an enduring personality trait for individuals who engage in repetitive

deliberate self-harm (Evans et al., 1996). In the present sample, impulsiveness as measured by the Eysenck Impulsiveness Questionnaire did not distinguish frequent and infrequent self-mutilation participants and the control group. However, for the Venturesomeness subscale of this questionnaire, the infrequent self-mutilation group scored significantly higher than the frequent group. Frequent and infrequent self-mutilation participants were not distinguished by scores for other subscales of the Eysenck Impulsiveness Questionnaire. Frequent self-mutilation participants reported a more extensive history of impulsive behaviours than the control group, however, no significant difference between frequent and infrequent groups was evident for history of impulsive behaviour.

The higher score for Venturesomeness for the infrequent self-mutilation group and the lack of difference between frequent and infrequent self-mutilation groups for history of impulsive behaviours has indicated that for some individuals, self-mutilation represents one form of a wider sensation seeking phenomenon. These individuals may experiment with self-mutilation and other impulsive behaviours although none may develop into a habitual pattern.

For others, repetitive self-mutilation may represent one part of a multi-impulsive behavioural disorder. Further research comparing the frequency and severity of the range of impulsive behaviours performed by people who repetitively self-mutilate, as

well as their motivations for engaging in the behaviour, with those who have engaged in a limited number of self-mutilative episodes would clarify this perspective.

8.4.5 Summary and conclusions

In summary, results have demonstrated that the feelings and experiences associated with the act of self-mutilation are qualitatively similar to the enduring psychological traits of individuals with a history of self-mutilation. In addition, there are no phenomenological differences in the symptoms associated with the self-mutilative behaviour of males and females. However, results have indicated that there may be some sex variation in motivations for engaging in the behaviour.

For some individuals, self-mutilation represents a reaction to transient unpleasant feelings and for others it becomes a habitual response to enduring unpleasant emotional states. For individuals who repetitively self-mutilate, the symptoms associated with the behaviour are more severe and more entrenched. However, it appears that it is the distress associated with these symptoms that mediates the need to engage in self-mutilation. The factors that alter this distress are unclear.

The development of a repetitive behavioural pattern of self-mutilation does not appear to be mediated by symptom severity alone. For individuals who only engage in a few episodes of self-mutilation, the behaviour may represent one form of a wider

sensation seeking phenomenon. An examination of the motivations for engaging in the behaviour for infrequent and frequent self-mutilation groups may clarify this notion.

Results of the present investigation have suggested that individuals who self-mutilate do not necessarily experience a greater number of stressful events or stressful events of a more severe nature than individuals who do not engage in the behaviour. Rather, it is the response to these events that influences the need to self-mutilate. Results have indicated that individuals who self-mutilate are emotionally labile and may overreact to both their own negative experiences and the perceived negative experiences of others.

Previous research has indicated that individuals who self-mutilate are not deficient in the skills necessary to cope with stressful experiences (Haines & Williams, 1997). However, results of the present investigation provide support for the proposition that they may be unable to control the urge to self-mutilate long enough to access these coping skills when distressed.

Results of the present study have demonstrated that individuals can control their self-mutilative behaviour without experiencing a significant alteration in symptomatology. This has important treatment implications. Treatment regimes may effectively target self-mutilative behaviour without an immediate focus on decreasing symptomatology. However, the question of why people stop cutting themselves without the aid of medication or

other therapeutic interventions remains. It may be that there is some alteration in the motivation for engaging in the behaviour or a change in the reinforcement mechanisms associated with self-mutilation that reduces the need to engage in the behaviour. The following chapters aim to clarify these issues.

CHAPTER 9

STUDY 3: MOTIVATION FOR SELF-MUTILATION

9.1 INTRODUCTION

It has been suggested that clarification of behavioural intent provides the key to understanding self-mutilation (Walsh & Rosen, 1988). However, as outlined in Chapter 2, a number of difficulties have been noted with regard to establishing the intent associated with self-mutilative behaviour. Researchers have indicated that simply asking individuals to explain their motivation for self-mutilation may not be a reliable method to establish behavioural intent (Morgan, 1979; Ross & McKay, 1979; Walsh & Rosen, 1988).

Any explanation regarding motivation for self-mutilation may be biased by a number of factors (Walsh & Rosen, 1988). First of all, reports have indicated that some individuals have presented for emergency treatment of self-mutilation have described their behaviour in suicidal terms to avoid a negative response from treatment professionals (Favazza, 1996; Favazza & Conterio, 1989; Solomon & Farrand, 1996; van Moffaert, 1990; Walsh & Rosen, 1988). In one large study, 56% of participants admitted that they sometimes told others they felt suicidal when, in fact, all they wanted to do was harm themselves (Favazza & Conterio, 1989).

Secondly, researchers have suggested that some individuals are unable to provide accurate information regarding the motivations for self-mutilation due to a lack of understanding of their own self-mutilative behaviour (Haines, Williams, Brain et al., 1995; Walsh & Rosen, 1988). Finally, it has been suggested that asking individuals in retrospect to explain their motivations for self-

mutilating is an unreliable method to establish intent as the memory of events and perceptions preceding the self-mutilative act are likely to be subject to a variety of distortions (Walsh & Rosen, 1988).

Nevertheless, the range of motivations described by individuals for engaging in self-mutilation has been consistent. Anecdotal reports and survey data have provided comprehensive information regarding the nature of these motivations (Favazza, 1989a). However, the relative importance of each of these motivations for maintaining self-mutilative behaviour has not been established.

Although it may be difficult to determine the original reason individuals have for engaging in the behaviour, a number of researchers have speculated regarding the factors that maintain self-mutilation (Bennum, 1983; Carr, 1977; Darche, 1990; Favazza, 1989a; Wanstall & Oei, 1989). These reports have indicated that self-mutilation is negatively reinforced by the termination or avoidance of an aversive stimulus following the occurrence of the behaviour. In particular, research has demonstrated that self-mutilation is maintained by the tension reducing qualities that the act provides (Haines, Williams, Brain et al., 1995). Self-mutilation also has been described as a learned operant, maintained by positive social reinforcement which occurs following performance of the behaviour (Carr, 1977; Favazza, 1989a).

Any given act of self-mutilation may be determined by a number of motivations that may be both internally and externally

directed. The following section outlines a range of internal and external motivations that have been associated with self-mutilation. Accurate identification of the factors that maintain self-mutilative behaviour is required if treatment is to be effectively targeted. For any given individual, a range of treatment strategies may be required in order to successfully eliminate each of the factors that serve to maintain self-mutilation (Carr, 1977).

9.1.1 Internally directed motivations

A range of internal motivations have been described for engaging in self-mutilation including to stop racing thoughts, to feel relaxed, to alleviate feelings of unreality, to release anger, to feel less depressed, to feel less lonely, to gratify a need for self-punishment, and to re-establish feelings of self-control (Bennum, 1983; Favazza, 1992). In particular, relief of mounting tension, discharge of anger at oneself or others, and alleviation of feelings of depersonalisation commonly have been reported (Bennum, 1983; Favazza & Conterio, 1989; Gardner & Gardner, 1975; Grunebaum & Klerman, 1967).

When asked to provide reasons for engaging in self-mutilation, 25% of one sample reported that the behaviour provides a feeling of pleasure and relief, 20% stated that self-mutilation related to feelings of anger and 20% reported depression as a motivation for self-mutilation (Graff & Mallin, 1967). In another study of 20 hospitalised self-mutilation participants, the main reason cited for engaging in self-mutilation was anger at oneself (9), followed by

tension relief (7), anger at others (2), and suicidal gesture (2) (Roy, 1978).

In a more comprehensive investigation, 72% of individuals reported that self-mutilation helps to control their mind when thoughts are racing, and 65% reported self-mutilating in order to feel relaxed (Favazza & Conterio, 1989). Others engaged in the behaviour to feel less depressed (58%), to feel real again (55%), and to feel less lonely (47%). In this sample, participants also reported that self-mutilation sometimes resulted from the need to atone for sins (40%).

One researcher suggested that there are three motivational factors for self-mutilation (Darche, 1990). First of all, self-mutilation was considered to be a response to depression where the act reflects feelings of hopelessness, a need to engage in self-punishment and may represent a suicidal gesture. Secondly, self-mutilation was considered to be a response to anxiety and tension. Indeed, a number of authors have noted that tension reduction following the act of self-mutilation reinforces the behaviour (e.g., Brain et al., in press, 1998; Favazza & Rosenthal, 1993; Haines, Williams, Brain et al., 1995; Wanstall & Oei, 1989) Finally, self-mutilation was associated with severe psychopathology and was interpreted as a response to delusional thinking. Included in this category was self-mutilation performed in order to terminate a state of depersonalisation (Darche, 1990).

Results indicated some support for all three motivational theories (Darche, 1990). Self-mutilation participants did demonstrate

more severe depression, minimal tolerance for tension, and more severe psychological symptoms that psychiatric control participants. However, it is suggested that the motivational categories outlined were not mutually exclusive. Indeed, the author noted that from the results of the investigation it was difficult to determine which, if any, of these factors was the primary motivation for self-mutilation.

The common factor for these motivational categories was the relief from feelings of psychological distress. Certainly, the relief from negative emotional states that the act of self-mutilation provides serves to reinforce the behaviour (Brain et al., in press, 1998; Haines, Williams, Brain et al., 1995). This increases the probability that the self-mutilation will occur again when the troublesome symptoms re-occur and maintains the behaviour as a maladaptive coping strategy (Favazza & Conterio, 1989; Tantam & Whittaker, 1992).

9.1.2 Externally directed motivations

Reports have indicated that the response of others to self-mutilation can serve as a very strong positive reinforcer of self-mutilative behaviour (Carr, 1977; Favazza, 1989a; Walsh & Rosen, 1988). Researchers have noted that some instances of self-mutilation are motivated by secondary gain (Grunebaum & Klerman, 1967; Shore, 1979). Even if not initially employed as a manipulative strategy, individuals who engage in the behaviour may quickly discover the rewarding interpersonal aspects of self-mutilation. In

fact, some individuals recognise their self-mutilative behaviour as an extremely effective social weapon (Walsh & Rosen, 1988).

Reports have indicated that self-mutilation has been used as an effective form of emotional blackmail (Favazza, 1989a). Self-mutilative behaviour has been used to elicit a caring response from others (Favazza, 1989a; Feldman, 1988; Offer & Barglow, 1960), as a method to avoid rejection by others (Offer & Barglow, 1960), as well as a means for making others feel guilty (Shore, 1979) and a tool for manipulating others into satisfying their wishes (Feldman, 1988).

Researchers have noted that some individuals use self-mutilation as a means of communicating distress or displeasure with others (Offer & Barglow, 1960; Schwartz et al., 1989; Walsh & Rosen, 1988). In one study, a substantial number of the adolescent self-mutilation participants engaged in 'retaliation self-mutilation'. For these individuals, self-mutilation sometimes was used as a method for getting even following rejection by a significant other or as a reaction to parental discipline (Schwartz et al., 1989).

Self-mutilation can serve as a powerful tool for manipulation of others, whether or not this is intentional, in situations of distressing interpersonal interaction (Carr, 1977; Favazza, 1989a; Johnson & Britt, 1967). Self-mutilation has been used as a means to facilitate escape from unpleasant or intolerable situations (e.g., transfer within a prison setting) (Jones, 1986; Yaroshevsky, 1975). If self-mutilation results in a decrease or elimination of an aversive

situation, the behaviour will be negatively reinforced (Walsh & Rosen, 1988).

A review of the literature has suggested that there presently is limited understanding of the reasons why self-mutilation is initially employed. Researchers have suggested that self-mutilation is learned in a hospital or institutional setting (Offer & Barglow, 1960; Ross & McKay, 1979; Simpson, 1975; Walsh & Rosen, 1988). This contagion effect of self-mutilation has been reported to cause havoc in treatment settings (Rosen & Walsh, 1989).

Patients who have modelled self-mutilation in a hospital setting have reported that they cut themselves because they thought it would help them gain prestige and social acceptance on the hospital ward (Offer & Barglow, 1960). In another study, patients who escalated their self-mutilative behaviour reported doing so in order to prove themselves the most unhappy on the ward (Simpson, 1976).

Self-mutilation may become a recurring pattern within the intense, dyadic relationships that are typical within treatment facilities (Rosen & Walsh, 1989). Particularly high incidences of self-mutilation have been noted in group home or inpatient settings where patients spend many hours per day in close contact with each other (Rosen, Walsh & Lucas, 1988). In one extensive study conducted at a training facility for delinquent girls, research demonstrated that acts of mutual skin cutting were intended to

express anger or jealousy as well as to demonstrate affection (Ross & McKay, 1979).

Contagion may be partly responsible for the high incidence of self-mutilation in institutional and hospital settings (Graff & Mallin, 1967; Johnson & Britt, 1967; Podvoll, 1969; Ross & McKay, 1979). In one study, self-mutilation participants frequently stated that they had learned the behaviour from fellow patients (Grunebaum & Klerman, 1967). However, contagion cannot account for all cases of self-mutilation. In one study, the researchers noted that the high number of participants who first cut themselves outside of a hospital setting suggests that self-mutilative behaviour is not simply a product of institutional life (Gardner & Gardner, 1975). In another study, 91% of individuals who self-mutilated had neither previously known or read about the behaviour (Favazza & Conterio, 1989). In further research, a group of self-mutilating prisoners reported modelling to be of little relevance as a motivation for engaging in self-mutilative behaviour (Haines, 1994). In fact, the majority of this sample reported a history of self-mutilation that preceded their incarceration. These results demonstrated that some factor other than modelling was responsible for the onset and maintenance of the behaviour (Haines, 1994).

In summary, a range of negative feelings have been reported to precede self-mutilation and research has indicated that relief from distressing psychological symptoms is the primary motivation for self-mutilation (Coid et al., 1992). The reduction in unpleasant

feeling that self-mutilation provides serves to effectively reinforce the behaviour (Favazza, 1992; Wanstall & Oei, 1989). However, environmental consequences of the behaviour also are important to the maintenance of self-mutilation (Offer & Barglow, 1960; Wanstall & Oei, 1989). Research has indicated that individuals who self-mutilate derive gratification from the attention they receive following self-injury (Coid et al., 1992) and that self-mutilation is reinforced by the positive social consequences the act promotes (Favazza, 1989a; Feldman, 1988; Grunebaum & Klerman, 1967; Shore, 1976; Walsh & Rosen, 1988). It generally has been accepted that these aspects of self-mutilation are secondary to the internal benefits that the act provides (Coid et al., 1992; Offer & Barglow, 1960).

9.1.3 Retrospective investigation of motivations for self-mutilation

In clinical research it is not always practical to access people who are currently engaging in the problem behaviour of interest. Clinicians may be reluctant to encourage clients to participate in research that is not directly involved with a current treatment programme. Some individuals simply may not be well enough to participate in research. It is suggested that the use of retrospective clinical samples could provide useful information regarding the nature of problem behaviours and the factors that motivate and maintain those behaviours.

Researchers have urged caution when interpreting data derived from retrospective samples (e.g., Salter & Platt, 1990; Walsh

& Rosen, 1988). For example, it has been suggested that the memory of the intent for self-mutilative behaviour is subject to a variety of distortions (Walsh & Rosen, 1988). In retrospect, individuals may provide explanations for their behaviour that were originally suggested to them by friends or treatment professionals. Whether these explanations resemble the actual intentions for engaging in self-mutilation is unclear (Walsh & Rosen, 1988).

The parasuicide literature has highlighted some of the problems associated with the retrospective assessment of suicidal intent. Ratings of suicidal intent associated with deliberate self-poisoning have been demonstrated to alter over time (Pokorny, Kaplan & Tsai, 1975; Salter & Platt, 1990). Level of reported suicidal intent has decreased following recovery from the medical effects of parasuicide (e.g., Pokorny et al., 1975). This decrease has been attributed to individuals developing a greater understanding of their parasuicidal behaviour as a result of a prolonged hospital stay. In contrast, the negative reaction of hospital staff has been implicated as a factor contributing to an increase in reported suicidal intent associated with parasuicidal behaviour (Salter & Platt, 1990). Researchers have noted the need for further research to clarify the reliability of retrospective information regarding suicidal intent and the factors associated with reinterpretation of behavioural motivation (Salter & Platt, 1990).

Researchers have utilised retrospective data to gain limited information regarding the nature of self-mutilative behaviours and

associated psychiatric diagnoses (e.g., Sonneborn & Vanstraelen, 1992). However, the reliability of information provided by individuals who are no longer engaging in the behaviour regarding the specific motivational and reinforcement processes of self-mutilation has not been determined. The present study aims to address this issue.

9.1.4 Sex differences in motivations for self-mutilation

There has been some suggestion that the self-mutilative behaviour of males and females is phenomenologically different (Gardner & Gardner, 1975; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Pao, 1969; Rosenthal et al., 1972). In addition, researchers have suggested that males engage in more severe self-mutilation that is more likely to be associated with suicidal intent (Kaplan & Fik, 1977; Pao, 1969). However, there has been no in depth consideration of any variation in the motivations that males and females may have for engaging in self-mutilative behaviour.

Results of the first study in this investigation demonstrated no appreciable differences in the nature and extent of self-mutilative behaviour between male and female participants. In addition, no significant difference in the degree of suicidal intent associated with these behaviours was noted. Results of the second study demonstrated no significant differences in the range and severity of symptoms associated with self-mutilation reported by males and females. However, results did indicate that female self-mutilation

participants may have a significantly greater tendency to overreact to negative experiences. As a result of this oversensitivity and because the present sample demonstrated a tendency to direct hostile feelings towards themselves, the degree of importance that female self-mutilation participants may associate with negative internal experiences as a motivation for self-mutilation may be significantly higher than for male self-mutilation participants. The present study aims to clarify this notion.

9.1.5 Development of repetitive self-mutilation

There has been little research regarding the reasons why some individuals develop a repetitive pattern of self-mutilative behaviour whereas others engage in only a few episodes of self-mutilation. It is suggested that individuals who frequently self-mutilate do so in order to alleviate feelings of distress associated with the high degree of symptomatology they experience. Certainly, the results of Study 2 have indicated that individuals who engage in frequent self-mutilation experience more severe symptoms than infrequent self-mutilation participants, particularly depression, anxiety, dissociation and feelings of guilt. As self-mutilation does not alter the individual's underlying psychopathology, the relief from the distressing emotional state that the act provides is short-lived (Favazza & Conterio, 1989; Lion & Conn, 1982). Due to its rewarding nature, self mutilation is repeated once the troublesome symptoms re-emerge (Brain et al., in press, 1998; Favazza & Conterio, 1989;

Haines, Williams, Brain et al., 1995; Tantam & Whittaker, 1992). Therefore, it is reasonable to expect that individuals who engage in the behaviour frequently would be more motivated to self-mutilate by these internal factors than individuals who have infrequently self-mutilated.

Results of Study 2 also have indicated that infrequent self-mutilation may be associated with a wider sensation seeking phenomenon and, therefore, may be motivated by different factors to habitual self-mutilation. Comparison of the motivations of frequent and infrequent self-mutilation groups for engaging in self-mutilative behaviour in the present study may clarify this perspective.

9.1.6 Aims and hypotheses

A review of the literature has indicated a scarcity of systematic research regarding the specific nature of the motivations individuals have for self-mutilating and the role these factors have in maintaining self-mutilation as a behavioural response. Few researchers directly have assessed motivations for engaging in self-mutilation. Instead, inferences regarding the reasons for engaging in self-mutilation have been derived from information concerning the symptoms reported by individuals who self-mutilate (e.g., Darche, 1990). It is suggested that direct assessment of the range of motivations that have been associated with self-mutilative behaviour would provide a more comprehensive understanding of

the process of self-mutilation and elicit accurate information regarding the factors that maintain the behaviour.

It was hypothesised that internal reasons such as tension reduction, depression and self-punishment would be most frequently reported by self-mutilation participants. It was expected that items regarding operant and extrapunitive factors would be less frequently endorsed. Due to the large proportion of individuals in the present sample who had never been hospitalised for treatment of self-mutilative behaviour, it was hypothesised that modelling would not feature as a motivation for self-mutilation.

A comparison of motivations reported by current and recovered self-mutilation groups was conducted to determine whether the motivations for engaging in the behaviour were reinterpreted when self-mutilation was no longer part of an individual's behavioural repertoire. Results of the first study in this investigation demonstrated that, for the total sample of self-mutilation participants, a low level of suicidal intent was associated with self-mutilation. In addition, no significant difference in the degree of suicidal intent associated with self-mutilation was evident between current and recovered self-mutilation groups. On this basis, in the present study it was anticipated that recovered self-mutilation participants would be able to provide an accurate representation of their motivations for engaging in previous self-mutilation. Therefore, no significant differences between the motivations for

self-mutilation described by current and recovered self-mutilation groups were hypothesised.

Comparison between male and female participants' reported motivations for self-mutilation also was conducted. As mentioned, results of Study 2 have indicated that female self-mutilation participants may have a significantly greater tendency to overreact to negative experiences than males. It was suggested that as a result of this oversensitivity, female self-mutilation participants may score significantly higher than male participants for distress related internal motivations such as tension reduction, depression and self-punishment than male self-mutilation participants. No other differences in the nature of the motivations for self-mutilation described by male and female participants were anticipated.

The motivations for self-mutilation described by frequent and infrequent self-mutilation groups also were compared in an effort to determine the role of motivational factors in the development of a repetitive pattern of self-mutilative behaviour. It was hypothesised that the frequent self-mutilation group would report a significantly higher degree of internal motivations for engaging in the behaviour, particularly those pertaining to tension reduction, depression and self-punishment than the infrequent self-mutilation group.

9.2 METHOD

9.2.1 Participants

The forty-six self-mutilation participants described in the first study completed this investigation.

9.2.2 Materials

A Motivation for Self-mutilation Scale (Haines, 1994) was used to determine the reasons participants had for engaging in self-mutilative behaviour. This scale was a modified form of a scale used to assess the motivation for attempted suicide (Henderson et al., 1977). This 45 item scale consisted of 8 subscales, Depression, Extrapunitive, Alienation, Operant, Modelling, Avoidance, Tension Reduction, and Janus Face which refers to an ambivalent attitude towards life and death. For the purposes of the present investigation, 5 additional items were included to assess intropunitive motivations for engaging in self-mutilation. Items were scored on a 3 point scale: (1) Not at all; (2) A little; and (3) A great deal, according to the relevance of that item for the individual. A copy of this scale is presented in Appendix F.

9.2.3 Procedure

The Motivation for Self-mutilation Scale was verbally presented to participants as part of the initial interview regarding the nature and extent of self-mutilative behaviour.

9.3 RESULTS

9.3.1 Overview

Initially, a repeated measures ANOVA was used to determine any significant differences between Motivation for Self-mutilation Scale subscale scores for the total sample of self-mutilation participants.

Secondly, unpaired t-tests were utilised to determine any differences between current and recovered self-mutilation groups, male and female self-mutilation participants, and frequent and infrequent self-mutilation groups for each subscale of the Motivation for Self-mutilation Scale.

9.3.2 Total sample

For the total sample of participants, significant differences between the subscale scores of the Motivation for Self-mutilation Scale were demonstrated, F (8, 312) = 24.57, $p < .0001$. Mean scores and standard deviations for each subscale are presented in Appendix G and means are illustrated in Figure 17.

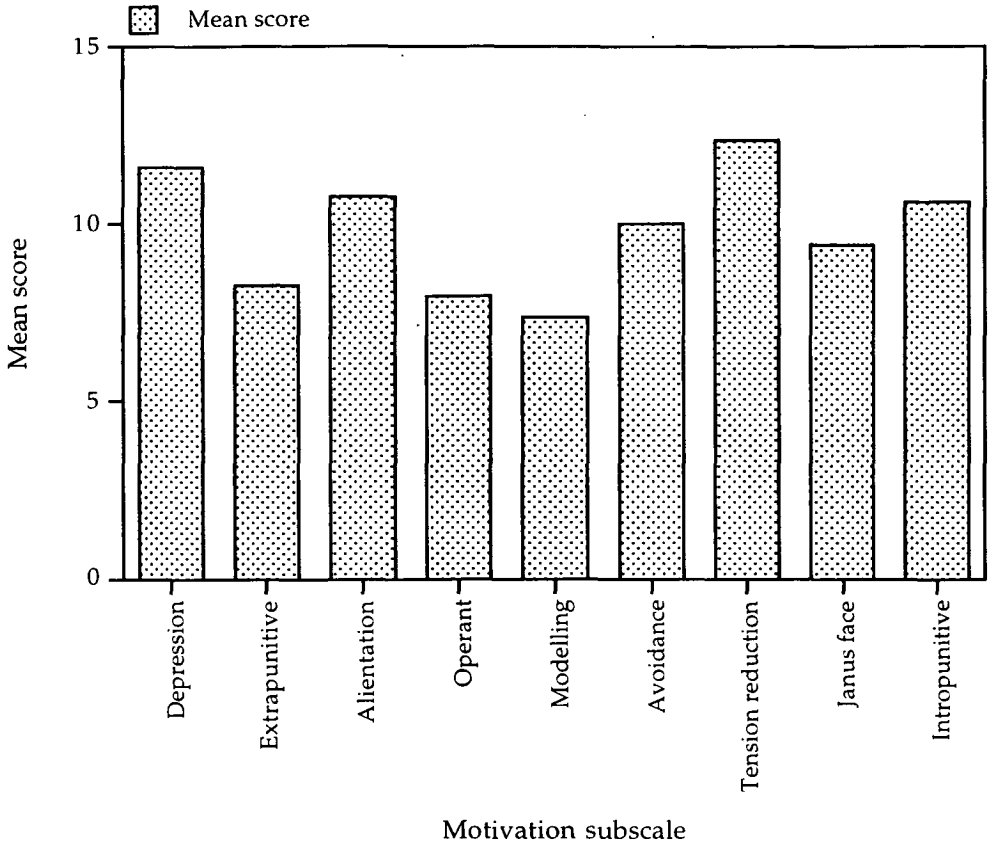


Figure 17. Mean scores for the Motivation for Self-mutilation Scale for the total sample of self-mutilation participants.

Post hoc analyses indicated that scores for Tension Reduction were significantly higher than scores for Alienation and Intropunitive subscales (Fisher LSD = 0.94, $p < .05$). Mean score derived for the Tension Reduction subscale did not significantly differ from the Depression subscale. Scores for the Depression subscale did not differ significantly from Alienation or Intropunitive subscales. No significant difference between the Intropunitive and Avoidance subscales were noted, or between Avoidance and Janus Face. The mean score for Janus Face was significantly lower than for

Tension Reduction, Depression, Alienation and Intropunitive subscales (Fisher LSD = 0.94, $p < .05$).

Post hoc analyses demonstrated a distinct motivational grouping for Extrapunitive, Operant and Modelling subscales. Mean scores for these subscales did not significantly differ from each other. However, for the total sample of participants, scores for these subscales were significantly lower than the means derived for all other subscales (Fisher LSD = 0.94, $p < .05$).

9.3.3 Current and recovered self-mutilation groups

Mean scores and standard deviations for current and recovered self-mutilation groups for each subscale of the Motivation for Self-mutilation Scale are presented in Appendix G. No significant differences between groups were indicated for any of the motivational subscales.

9.3.4 Sex differences in motivation for self-mutilation

Mean scores and standard deviations for male and female self-mutilation participants for each subscale of the Motivation for Self-mutilation Scale are presented in Appendix G. Significant differences between males and females were evident for the Depression, t (44) = 2.23, $p < .05$; Tension Reduction, t (44) = 3.93, $p < .001$; and Intropunitive subscales, t (44) = 3.67, $p < .05$. Figure 18 illustrates that female participants scored significantly higher than male participants for these subscales.

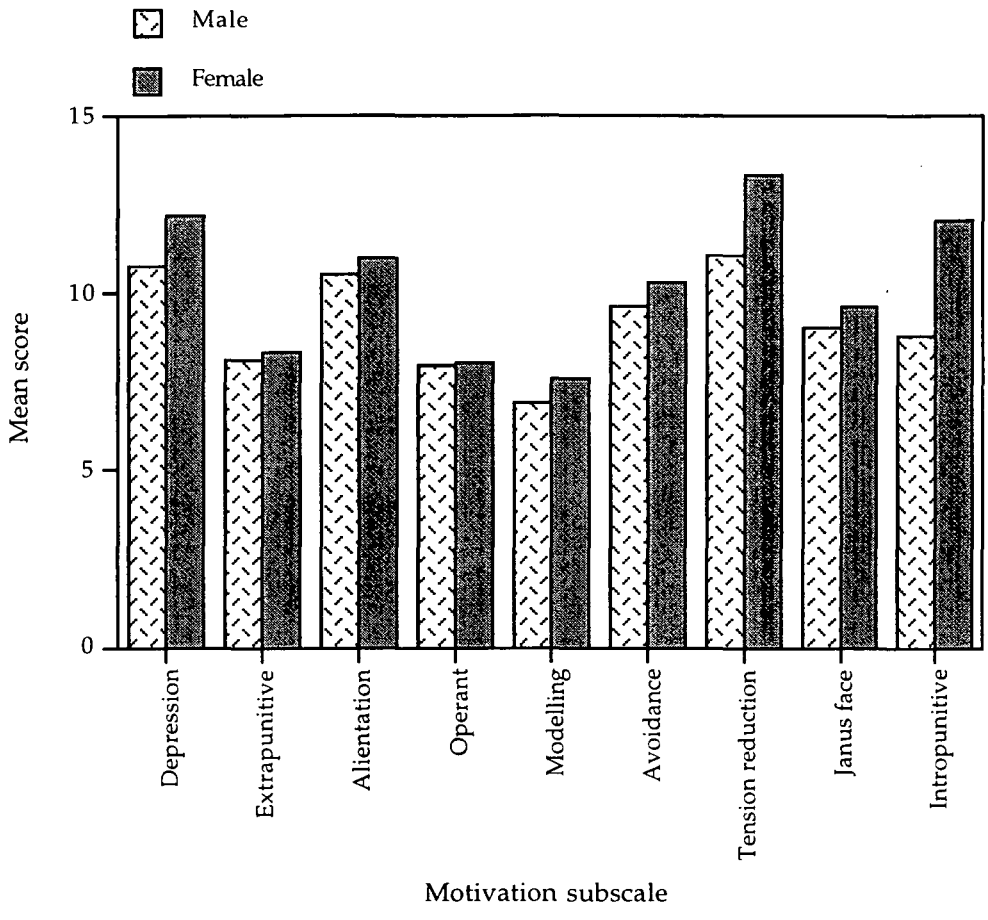


Figure 18. Mean scores for the Motivation for Self-mutilation Scale for the male and female self-mutilation participants.

For male self-mutilation participants, a significant variation in subscale scores was evident, F (8, 136) = 7.93, $p < .0001$. No significant differences between Tension Reduction, Depression and Alienation subscales were noted, nor did these subscale scores differ significantly from the Avoidance subscale. Mean scores for Tension Reduction, Depression and Alienation were significantly higher than scores elicited for all other subscales (Fisher LSD = 1.36, $p < .05$). Mean score for Avoidance did not differ significantly from Janus Face or Intropunitive subscales but was significantly higher than the mean

score indicated for the Operant, Extrapunitive and Modelling subscales (Fisher LSD = 1.36, $p < .05$). No significant differences between scores for Janus Face and Intropunitive, Janus Face and Operant, Intropunitive and Operant, Janus Face and Extrapunitive, or Intropunitive and Extrapunitive subscales were demonstrated. Scores for Operant, Extrapunitive and Modelling subscales did not differ significantly from each other, however, scores for Modelling were significantly lower than for all other subscales (Fisher LSD = 1.36, $p < .05$).

For the female self-mutilation group, a significant difference between subscale scores for the motivation scale also was evident, F (8, 168) = 20.42, $p < .0001$. No significant differences between Tension Reduction, Intropunitive and Depression subscales were noted. Mean score for the Tension Reduction subscale was significantly higher than for all other subscales (Fisher LSD = 1.26, $p < .05$). No significant differences between the Intropunitive, Depression and Alienation subscales were demonstrated. Scores for Intropunitive and Depression were significantly higher than for all other subscales (Fisher LSD = 1.26, $p < .05$). Mean scores for Alienation, Avoidance and Janus Face did not differ significantly from each other. In addition, Extrapunitive, Operant and Modelling subscale scores did not differ significantly from each other. Scores for these subscales were significantly lower than for all other motivation subscales (Fisher LSD = 1.26, $p < .05$).

9.3.5 Frequent/infrequent self-mutilation group comparisons

Mean scores and standard deviations for frequent and infrequent self-mutilation groups for each of the motivation subscales are presented in Appendix G. Frequent self-mutilation participants only scored significantly higher than the infrequent group for the Intropunitive subscale, t (35) = 2.37, $p < .05$. Subscale scores for frequent and infrequent self-mutilation groups are illustrated in Figure 19.

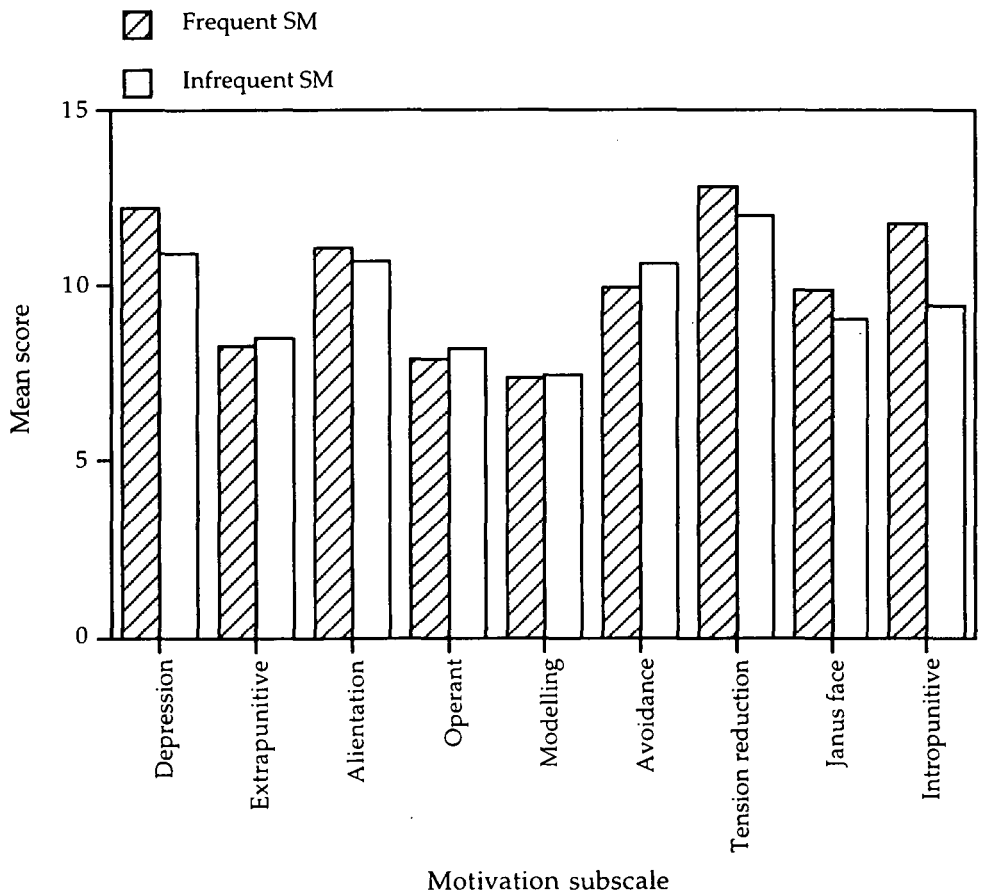


Figure 19. Mean scores for the Motivation for Self-mutilation Scale for the frequent and infrequent self-mutilation groups.

A significant variation in subscale scores for the frequent self-mutilation group was evident, F (8, 184) = 21.88, $p < .0001$. No

significant differences between Tension Reduction, Depression, and Intropunitive subscales were demonstrated. Mean score for Tension Reduction was significantly higher than all other subscales (Fisher LSD = 1.19, $p < .05$). No significant difference between Depression and Alienation or Intropunitive and Alienation subscales were noted. Scores for Depression and Intropunitive subscales were significantly higher than for all other subscales (Fisher LSD = 1.19, $p < .05$). There was no significant difference between scores for Alienation and Janus Face or Janus Face and Avoidance. However, mean Avoidance score was significantly lower than for all other internal motivation subscales (Fisher LSD = 1.19, $p < .05$). For the frequent self-mutilation group, the external motivation subscales formed a distinct cluster. Scores for Extrapunitive, Operant and Modelling subscales did not differ significantly from each other, but were significantly lower than scores elicited for all other subscales (Fisher LSD = 1.19, $p < .05$).

For the infrequent self-mutilation group, mean scores for Tension Reduction, Depression, Alienation and Avoidance did not differ significantly from each other. Mean score for Tension Reduction was significantly higher than for all other subscales (Fisher LSD = 1.19, $p < .05$). There was no significant difference between the Depression, Alienation and Avoidance subscales and the Intropunitive subscale. Mean score for Depression was significantly higher than Janus Face, Operant, Extrapunitive and Modelling subscales (Fisher LSD = 1.19, $p < .05$). No significant differences

between scores for Alienation, Avoidance, Intropunitive and Janus Face were evident. Scores for Alienation and Avoidance were significantly higher than scores for Operant, Extrapunitive and Modelling subscales (Fisher LSD = 1.19, $p < .05$). Mean score for Modelling was significantly lower than for the Intropunitive subscale (Fisher LSD = 1.19, $p < .05$). No other significant differences between scores for motivational subscales were noted for the infrequent group.

9.4 DISCUSSION

9.4.1 Motivations for self-mutilation

As hypothesised, results of the present investigation have demonstrated that self-mutilation is primarily motivated by internal factors. For the total sample of participants, two distinct motivational groups were identified. Intrinsic motivational factors constituted the first group. The range of internal motivations for self-mutilation that have been outlined in previous research were described by the present self-mutilation sample. Tension reduction was the most commonly cited reason for engaging in the behaviour. Other internal motivations for self-mutilation were endorsed in the following descending order of importance; Depression, Alienation, Self-punishment, Avoidance and Janus Face.

The external or interpersonal aspects of self-mutilation were of considerably less importance to the present sample of participants as motivations for the self-mutilative behaviour. Scores for

Extrapunitive, Operant and Modelling subscales were significantly lower than for all of the internal motivational subscales. However, scores for these subscales did not differ significantly from each other. These results have indicated that for the present sample, self-mutilative behaviour is motivated by the need to obtain relief from distressing feelings, particularly tension. For this sample, the social consequences of self-mutilation were not significant motivational factors for engaging in the behaviour.

Indeed, other researchers have speculated that it is the relief from a distressing psychological state (particularly intolerable tension) that primarily serves to reinforce self-mutilative behaviour (Brain et al., in press, 1998; Favazza & Rosenthal, 1993; Haines, Williams, Brain et al., 1995; Wanstall & Oei, 1989). Whereas the social benefits of the act have been noted, and, for some individuals may be highly motivating aspects of the behaviour, generally these factors have been considered to be of secondary importance in maintaining self-mutilation (Coid et al., 1992; Offer & Barglow, 1960).

A range of reasons for engaging in self-mutilation including tension reduction and release of anger have been cited (Bennum, 1983; Favazza & Conterio, 1989; Gardner & Gardner, 1975; Grunebaum & Klerman, 1967; Pattison & Kahan, 1983; Roy, 1978). Individuals also have reported that feelings of depression and suicidal ideation are associated with self-mutilation (Favazza & Conterio, 1989; Gardner & Gardner, 1975; Graff & Mallin, 1967; Pattison & Kahan, 1983; Roy, 1978). Researchers have interpreted

these results as evidence of the complex nature of the motivational processes associated with self-mutilation (Walsh & Rosen, 1988). However, results of the present investigation have indicated that a more straight forward explanation is appropriate.

Common to all of the motivations for self-mutilation that have been described is the desire to reduce feelings of psychological distress (Coid et al., 1992; Offer & Barglow, 1960; Walsh & Rosen, 1988). Indeed, results of the second study in this investigation have emphasised the mediating role of psychological distress in self-mutilative behaviour. It is proposed that feelings of anger, depression, a need for self-punishment, avoidance, and suicidal thoughts all may precede self-mutilation and are determined by the nature of the specific precipitants. The escalation of these unpleasant feelings leads to an increase in psychophysiological arousal and feelings of unbearable tension and anxiety become the predominant affect preceding the self-mutilative act. Anecdotal reports of the phenomenology of self-mutilation have supported this notion (Herpertz, 1995; Simpson, 1975, 1976).

As described in Chapter 6, as tension escalates, a transition into the unpleasant state of depersonalisation may occur (Feldman, 1988; Gardner & Gardner, 1975; Pao, 1969; Rosenthal et al., 1972; Winchel & Stanley, 1991). It is suggested that it is the distress associated with this unpleasant emotional and heightened psychophysiological state that produces the need to self-mutilate. The reduction in these feelings of tension that self-mutilation provides reinforces the behaviour (Brain

et al., in press, 1998; Favazza & Conterio, 1989; Haines, Williams, Brain et al., 1995; Tantam & Whittaker, 1992).

Some empirical support for this notion has been demonstrated. A significant reduction in psychophysiological arousal associated with the act of self-mutilation was demonstrated in an incarcerated self-mutilation sample (Haines, Williams, Brain et al., 1995), indicating that self-mutilation is primarily reinforced by the psychophysiological arousal reduction qualities of the act itself. This study will be described in greater detail in the following chapter. Thorough assessment of psychophysiological reinforcement aspects of the act of self-mutilation in a broader population of people who self-mutilate is required to determine the generalisability of these results.

9.4.2 Retrospective investigation of motivations for self-mutilation

A significant amount of cognitive reorganisation has been noted following parasuicide (Farberow, 1950). Researchers have suggested that this process accounts for the reinterpretation of suicidal intent that has been noted following recovery from the physical effects of self-poisoning (Pokorny et al., 1975; Salter & Platt, 1990). However, reports regarding the nature of this reinterpretation have been conflicting. As mentioned previously, some researchers have noted a decrease in suicidal intent assoicated with parasuicide over time (e.g., Pokorny et al., 1975). In contrast, others have described a positive correlation between reported suicidal intent and

elapsed time following parasuicidal behaviour (Salter & Platt, 1990). These authors interpreted the increase in reported suicidal intent as associated with a subconscious manipulation of the reaction of hospital staff to the parasuicidal patient. It was suggested that individuals who were thought to have seriously attempted suicide were treated with more sympathy by hospital staff than individuals hospitalised for the treatment of parasuicidal behaviour (Salter & Platt, 1990). Certainly, a negative reaction of hospital staff to parasuicidal and self-mutilative behaviour has been recognised (e.g., Grunebaum & Klerman, 1967; Nelson & Grunebaum, 1971; Podvoll, 1969). Researchers have noted the need for further research regarding the nature of cognitive reorganisation following parasuicide and the factors associated with this phenomenon (Salter & Platt, 1990).

No reinterpretation of the intent associated with the behaviour has been demonstrated with regard to self-mutilation. Results of the first study in this investigation demonstrated no reinterpretation of the intent associated with self-mutilation for individuals who were no longer engaging in the behaviour. In addition, results of the present study have indicated that even when they are no longer engaging in the behaviour, individuals with a history of self-mutilation are able to accurately recall and describe the motives they had for self-mutilating.

The present sample of participants initially reported low levels of suicidal intent associated with self-mutilation indicating that self-

mutilative behaviour is motivated by other factors. In addition, the lack of help seeking behaviour reported by the present sample may have eliminated any need to reinterpret the intent associated with self-mutilation. In fact, results of the present study have indicated that retrospective samples can provide important and accurate information regarding the factors associated with the maintenance of clinical behaviours.

9.4.3 Sex differences in motivation for self-mutilation

Results of the previous study suggested that female self-mutilation participants are particularly likely to overreact to negative experiences. In addition, research has demonstrated that females are more introspective and self-focused than males and that this increased self-focused attention is associated with the experience of greater emotional distress following negative events (Ingram et al., 1988). As a result of this oversensitivity, it was hypothesised that female self-mutilation participants would interpret negative internal experiences as significantly more important motivations for self-mutilation than male participants. Results supported this hypothesis. Items citing depressive, tension reducing and intropunitive reasons for self-mutilating were significantly more highly endorsed by female than by male participants.

Both male and female participants cited a need to reduce tension as the factor most commonly associated with self-mutilation. However, the distinction between internal and external motivations

was less well defined for male than female participants. Male participants endorsed the motivations for self-mutilation in the following descending order of importance: Tension Reduction, Depression, Alienation, Avoidance, Janus Face, Intropunitive, Extrapunitive, Operant and Modelling. For female participants a distinct grouping for internal and external motivations was demonstrated.

Rather than being indicative of any substantial difference in the factors that motivate and maintain self-mutilation, it is likely that these results reflect a heightened awareness of internal states for female participants. Investigation of the factors that motivate and maintain self-mutilation using other methods, such as psychophysiological assessment, should clarify this perspective.

9.4.4 Development of repetitive self-mutilation

As outlined previously, there has been little systematic research regarding the specific factors that are associated with the development of a repetitive pattern of self-mutilative behaviour. Results of the previous investigation demonstrated that frequent self-mutilation participants experienced a broader range of symptoms, greater symptom severity, and were more distressed regarding the presence of psychological symptoms, than the infrequent group. It was suggested that these symptom related factors are important to the development of a repetitive pattern of self-mutilative behaviour. It was expected that these factors would be

reflected in the motivations described by participants for engaging in the behaviour. Therefore, in the present study it was hypothesised that the internal motivations for engaging in self-mutilation would be more highly endorsed by frequent than infrequent self-mutilation participants.

Results provided some support for this notion. For the frequent self-mutilation group, the distinction between internal and external motivations for engaging in the behaviour was quite clear. The desire to reduce tension and to express feelings of depression and self-punishment were of primary importance in promoting self-mutilation for frequent self-mutilation participants. External factors played a secondary motivational role for this group. These results have provided further evidence for the suggestion that it is the relief from distressing emotional states that self-mutilation provides, rather than the social benefits that may follow the act, that encourages the development of a habitual self-mutilation response (Coid et al., 1992; Offer & Barglow, 1960).

It was suggested in Chapter 8 that development of a repetitive pattern of self-mutilation is not the result of symptom severity alone. Results of the present study have supported this notion. The intropunitive aspect of self-mutilation was the only motivational factor that significantly distinguished the infrequent and frequent self-mutilation groups. For frequent self-mutilation participants, the need to punish oneself was reported to be a significantly greater determinant of self-mutilative behaviour than for the infrequent

group. Results of Study 2 demonstrated that frequent self-mutilation participants evidenced significantly higher feelings of guilt than the infrequent group. The need to act out these self-directed feelings of guilt appears to be associated with the development of a repetitive pattern of self-mutilation.

Results of the second study in this investigation indicated that although they did not experience the same range or severity of symptoms as frequent self-mutilation participants, the infrequent group were not symptom free. In addition, these results indicated that for the infrequent group, self-mutilation may represent part of a wider sensation seeking phenomenon. The motivations reported for engaging in self-mutilative behaviour were less well defined for the infrequent than for the frequent self-mutilation group. However, self-mutilation appeared to be utilised as a response to feelings of distress for infrequent self-mutilation participants in the same manner as for the frequent self-mutilation group. For the infrequent group, self-mutilation periodically may be employed, along with a range of other strategies, to effectively relieve transient negative emotional states. Investigation of the processes associated with the actual act of self-mutilation for frequent and infrequent participants would clarify this notion.

9.4.5 Summary and conclusions

Results of the present study have supported the notion that self-mutilation is motivated by a desire to reduce unpleasant emotional states and that the social consequences of self-mutilation are of secondary importance (Coid et al., 1992; Offer & Barglow, 1960). In particular, regardless of sex, whether they were currently engaging in the behaviour, or frequency of self-mutilation, all participants reported tension reduction as the primary motive for self-mutilation. It is suggested that feelings such as depression, anger, alienation, hopelessness, and the desire for self-punishment are associated with the events that precipitate self-mutilation and that these factors may vary between groups of people who engage in the behaviour. However, as these negative feelings escalate, anxiety or unbearable tension becomes the predominant affect (Herpertz, 1995; Simpson, 1975, 1976). It is this experience of intolerable tension and anxiety that promotes self-mutilation.

Researchers have noted that self-mutilation is a notoriously difficult behaviour to treat (Feldman, 1988; Raine, 1984; Simpson, 1976; Thorburn, 1984; van Moffaert, 1990). Traditionally, treatment strategies for self-mutilation have focused on the development of interpersonal and coping skills (Feldman, 1988; Raine, 1982; Simpson, 1976). The rationale for these strategies has been to prevent the negative events and feelings that precipitate self-mutilation from occurring and thereby circumvent feelings of distress and the need to engage in the behaviour. However, reports have indicated that these

strategies generally have been unsuccessful in controlling self-mutilation on a long term basis (Walsh & Rosen, 1988).

Enhancement of stress management skills and substitution of self-mutilation for a more appropriate tension reducing technique also have been suggested (Graff & Mallin, 1967; Gardner & Gardner, 1975; Kaminer & Shahar, 1987; Rosen & Thomas, 1984). Again, the success of these strategies has varied (Walsh & Rosen, 1988). The very nature of self-mutilative behaviour is a testimony to the desperation of the individual to control unpleasant feelings. Therefore, substitution of self-mutilation for a strategy that reduces tension to the same degree is extremely difficult. However, given that tension reduction is the primary motive for engaging in the behaviour it makes sense that this factor is the principal target for treatment. Thorough examination of the tension reduction qualities of the act of self-mutilation is required if therapeutic strategies are to be effectively targeted. The following chapter addresses this issue.

CHAPTER 10

STUDY 4: THE PSYCHOPHYSIOLOGY OF SELF-MUTILATION

10.1 INTRODUCTION

10.1.1 Tension reduction model of self-mutilation

Clinical and anecdotal reports consistently have indicated that self-mutilation acts as a catalyst for tension reduction (Favazza & Conterio, 1989; Gardner & Gardner, 1975; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Haines, Williams, Brain et al., 1995; Lion & Conn, 1982; Pao, 1969; Rosenthal et al., 1972; Simpson, 1975, 1976; van Moffaert, 1990). Compulsive, episodic and repetitive self-mutilative behaviours all have been associated with the relief from mounting anxiety or intolerable tension, or with feelings of gratification (Favazza & Simeon, 1995; Wells, Haines, Williams et al., in press). These reports are consistent with the tension reduction model of self-mutilation (Carr, 1977; Bennun [sic], 1984).

The tension reduction model represents a simple drive reduction mechanism. Researchers have proposed that upon the experience of intolerable anxiety and tension, individuals injure themselves in an effort to reduce these unpleasant, escalating feelings (Bennun [sic], 1984; Haines, Williams, Brain et al., 1995). Any relief, albeit temporary, from this distressing mental state serves to reinforce the behaviour and increase the likelihood of self-mutilation occurring again when similar emotions are experienced (Bennun [sic], 1984; Favazza & Conterio, 1989; Feldman, 1988; Tantam & Whittaker, 1992; Walsh & Rosen, 1988).

As mentioned, a repetitive pattern of self-mutilative behaviour has been well documented (e.g., Bancroft & Marsack, 1977;

Favazza, 1992; Favazza & Conterio, 1988; Favazza & Rosenthal, 1993). In fact, these reports have led to the proposal of a repetitive self-mutilation syndrome (Favazza, 1992; Favazza & Rosenthal, 1993). The tension reduction model has indicated that individuals who repetitively self-mutilate are trapped in a psychophysiological arousal related reinforcement process (Haines, Williams, Brain et al., 1995). This internal reinforcement pattern alone may suffice to maintain self-mutilation as a behavioural response (Walsh & Rosen, 1988). In order for self-mutilative behaviour to be managed effectively, the reinforcement processes associated with the act need to be clearly defined. Yet, until recently, the psychophysiological components of self-mutilation had not been determined.

The measurement of the psychophysiological processes that occur during the act of self-mutilation has presented methodological difficulties. It is neither ethically nor logistically possible to record psychophysiological states while a person is actually engaging in self-mutilative behaviour. Previous research has demonstrated the utility of using guided imagery to assess the psychophysiological processes underlying specific clinical behaviours (Brain et al., in press, 1998; Driscoll et al., 1996., 1997; Haines, Williams, Brain et al., 1995; Wells, Haines, Williams et al., in press; Williams et al., 1995, 1989). The use of guided imagery as a means of assessing psychophysiological states has been empirically supported (Borkovec & Hu, 1990; Brain et al., 1996; Cook, Melamed, Cuthbert, McNeil &

Lang, 1988; Lang, 1979; Lang et al. 1980; Pitman et al., 1987; Watkins, Clum, Borden, Broyles & Hayes, 1990).

The effective application of imagery techniques is reliant on the elicitation of a realistic arousal response with regard to imagery content. A number of factors have been identified as influencing the strength and quality of arousal response to guided imagery. These include the nature of the information incorporated in guided imagery (Borkovec & Hu, 1990; Hirota & Hirai, 1986; Lang et al., 1980); the construction of guided imagery (Contrada et al., 1991); and imagery ability (Miller et al., 1987).

Psychophysiological responses to an image or memory of an event have been demonstrated to simulate those responses experienced during the actual execution of the act (Lang, 1979). Increased psychophysiological arousal to unstructured imagery of sporting events has been demonstrated (Beyer, Weiss, Hansen, Wolf & Seidel, 1990; Deschaumes-Molinaro, Dittmar & Vernet-Maury, 1991). However, there was no particular order of presentation of images or focus on any particular aspects of the events. This type of imagery methodology has limited use in clinical psychology. Using unstructured imagery it is not possible to examine changes in psychophysiological arousal or emotional response during the course of an activity or behaviour which is necessary if the specific arousal patterns associated with that behaviour are to be identified. Using guided imagery it has been possible to more closely investigate the nature of these responses (Haines, Williams, Brain et al., 1995).

The content of guided imagery has been demonstrated to effect the psychophysiological response to that imagery. Guided imagery emphasising an active response ('response' imagery) has elicited greater arousal responses than guided imagery concentrating only on stimulus detail ('stimulus' imagery) (Borkovec & Hu, 1990; Hirota & Hirai, 1986; Lang et al., 1980). A focus on the physical properties of the imaged scene in combination with imaging active participation in the scene have been demonstrated to enhance psychophysiological arousal in response to imagery (Bauer & Craighead, 1979).

Increased psychophysiological responses have been recorded for imagery scenes with which the participant is familiar (e.g., Deschaumes-Molinaro, Dittmar & Vernet-Maury, 1992). Indeed, personally relevant imagery has been demonstrated to be superior to standard imagery in the ability to elicit realistic psychophysiological responses (Contrada et al., 1991; Pitman et al., 1987). There is evidence to suggest that the more realistic and relevant the imagery scene, the better it suits therapeutic purposes (Watkins et al., 1990). Using personalised imagery individuals' responses to specific problem situations can be investigated and treatment programmes tailored more effectively.

Lang (1979) alluded to the benefit of using participants with superior imagery ability in imagery related research as these individuals have exhibited higher rates of responding to standard imagery than individuals with poor imagery alibility. However, with training the responses of poor imagers to standard imagery

were increased (Hirota & Hirai, 1986). Further, research has indicated that the use of personalised imagery may largely overcome the limitations of poor imagery ability (Brain et al., 1996; Haines, Williams, Brain et al., 1995; Miller et al., 1987).

It is likely that the members of any clinical group will vary considerably in their ability to image information presented when using a guided imagery methodology. In addition, many individuals lack the ability to distinguish alteration in their psychophysiological arousal and, therefore, may be unable to generate realistic response oriented information for imagery script inclusion. Research has demonstrated that when imagery scripts are personalised, a realistic psychophysiological and psychological response to the memory of an event may be generated regardless of imagery ability or inclusion of response oriented information (Brain et al., 1996).

A variety of imagery techniques have been employed in research and clinical application. Researchers have used sounds and tones (Blanchard, Kolb, Pallmeyer & Gerardi, 1982), imagery training (Acosto & Vila, 1990; Lang et al., 1980) and repeated presentations of taped imagery scenes to enhance participants' response to imagery (Holzman & Levis, 1989; Watkins et al., 1990). Some of these methodologies may have unnecessarily complicated the process of eliciting a realistic arousal response to imaged events. None have allowed for a structured definition of the arousal responses associated with specific elements of problem behaviours.

Research has indicated that it is possible to chart the factors associated with the process of specific clinical behaviours using guided imagery presented in stages (Haines, Williams, Brain et al., 1995; Williams et al., 1989, 1995). Using a stage based guided imagery methodology, the psychophysiological processes of punitive and non-punitive parent-child interactions (Williams et al., 1989), self-mutilation (Brain et al., in press, 1998; Haines, Williams, Brain et al., 1995), self-poisoning (Driscoll et al., 1996, 1997), nail biting (Wells, Haines, Williams et al., in press), binge-purge episodes (Williams et al., 1995), occupational stress and workplace phobia (Carson, Haines & Williams, in press; McLaren, Haines & Williams, 1996), and obsessive-compulsive behaviours (Haines, Josephs, Williams & Wells, 1998) have been delineated. These studies have indicated that progression through four stages allows for a gradual and realistic increase in the intensity of psychophysiological and emotional responses during the course of imaged behaviour. In this way, the specific reinforcement mechanisms of problem behaviours can be identified and treatment can be targeted more effectively.

Self-mutilation is a behaviour that is well suited to investigation using a stage based guided imagery methodology. The phenomenology of self-mutilation has been well documented and specific components of the behaviour have been identified. Using a four stage guided imagery methodology, the specific reinforcement processes of self-mutilation have been delineated and the tension reduction pattern that has been reported in the clinical literature has

been empirically verified (Haines, Williams, Brain et al., 1995). Self-mutilating prisoners were interviewed regarding the details of a previous self-mutilative episode. This information was used for the construction of personalised guided imagery scripts. Script information was verbally presented in stages to allow accurate identification of the specific reinforcement processes that the act provides. In the first stage, the environment in which the behaviour occurred and the circumstances, thoughts and feelings prior to self-mutilation were imaged. In the second stage, the approach to the behaviour was described. This included a detailed description of the events, thoughts and feelings leading up to the point of self-mutilation. The incident stage described the actual act of self-injury and the thoughts and feelings that accompanied that behaviour. The final stage of the imagery script detailed the events immediately following self-injury, and the thoughts and feelings experienced at that time.

At the incident stage of imagery, when the actual act of self-injury was depicted, an immediate and significant reduction in arousal was evident. This was compared with a significant increase in psychophysiological arousal when accidental injury was imaged. Results of this study indicated that the self-mutilative behaviour is reinforced by this reduction in psychophysiological arousal (Haines, Williams, Brain et al., 1995) and that this tension reduction pattern is unique to injury that is self-inflicted. Results demonstrated no significant differences between the self-mutilation group and a

control group with no history of self-mutilation in terms of psychophysiological and psychological responses to control imagery scripts depicting accidental injury, anger and neutral events. This has indicated that individuals who self-mutilate respond appropriately to events that are experienced by most people (Haines, Williams, Brain et al., 1995).

Using this guided imagery methodology, it was also possible to identify the psychological states during the act of self-mutilation. Individuals were asked to rate how they were feeling during each stage of self-mutilation imagery on a number of dimensions related to the phenomenology of self-mutilation. Results indicated a tension reduction pattern for psychological response to self-mutilation. That is, self-mutilating prisoners reported that the act of self-mutilation made them feel better. However, this reported reduction in negative feeling did not occur significantly until the consequence stage of imagery, after the act of cutting was complete. This result represented a lag between the reduction of psychophysiological arousal and reported unpleasant feeling (Haines, Williams, Brain et al., 1995). Individuals who self-mutilate often are unable to provide an explanation for their own self-mutilative behaviour (Favazza & Conterio, 1989; Simpson, 1976; Walsh & Rosen, 1988). Results of this study indicated that it is the alteration of psychophysiological arousal that operates to reinforce the behaviour, rather than the emotional response (Haines, Williams, Brain et al., 1995).

Results of Study 3 demonstrated that tension reduction is the primary motivating factor for self-mutilation in the present sample. Therefore, in the present study it was anticipated the tension reduction pattern to self-mutilation depicted in an incarcerated sample (Haines, Williams, Brain et al., 1995) would be replicated in the present self-mutilation sample. It was hypothesised that the lag between the reduction in psychophysiological and psychological arousal also would be evident in this sample of self-mutilation participants. It also was hypothesised that the pattern of psychophysiological and subjective response to self-mutilation would be quite different to that elicited in response to accidental injury, anger and neutral events.

10.1.2 Tension reduction and cessation of self-mutilation

As outlined in Chapter 9, in clinical research it is not always practical to access people who are currently engaging in the problem behaviour. Results of Study 3 have indicated the value of including in research projects individuals who are no longer engaging in self-mutilation. Preliminary research has indicated the efficacy of a four stage guided imagery methodology in delineating the processes of the self-mutilative act in a retrospective sample of individuals who have self-mutilated (Brain et al., 1998). In the present study, it was of interest to clarify the efficacy of a guided imagery methodology in the retrospective investigation of clinical behaviour.

In the present investigation it initially was anticipated that the need to self-mutilate would be diminished if the unpleasant symptoms associated with the behaviour were resolved. However, results of the second study in this investigation demonstrated no significant differences in the type or degree of psychological symptoms experienced by current and recovered self-mutilation participants. However, an alteration in the degree of distress associated with this symptomatology was implicated as a factor that influences management of self-mutilation. The factors that mediate this experience of distress remain unclear.

Examination of the processes associated with the self-mutilative act itself may clarify the reasons why some people stop engaging in self-mutilation despite continuing to experience significant symptomatology. In the third study, both the current and recovered self-mutilation groups reported that they engaged in self-mutilative behaviour in an effort to reduce unpleasant feelings, primarily tension. It is plausible that some change in the efficacy of the self-mutilative act in providing the desired relief from tension is responsible for the cessation of the behaviour. A comparison of the pattern of psychophysiological arousal and psychological response of current and recovered self-mutilation participants to self-mutilation imagery was conducted in the present study to verify this notion.

It was anticipated that an alteration in the pattern of psychophysiological response to self-mutilation would be evident for individuals who were longer engaging in the behaviour.

Specifically, it was hypothesised that current self-mutilation participants would evidence a significantly stronger pattern of psychophysiological arousal reduction to imagery depicting a self-mutilative episode than recovered self-mutilation participants. Results of study 3 indicated that recovered self-mutilation participants were able to accurately recall motivations for engaging in self-mutilation. Therefore, no reinterpretation of psychological response to the self-mutilative act was anticipated for the recovered group in the present study. No significant differences between current and recovered self-mutilation participants were hypothesised for psychological response to self-mutilation imagery.

10.1.3 Sex differences

The previous studies have highlighted some differences between males and females in terms of symptomatology and motivations for engaging in self-mutilative behaviour. However, no differences between the nature and extent of self-mutilative behaviour has been demonstrated between the sexes. It was of interest to determine whether there were any differences between males and females for the psychological and psychophysiological processes associated with the act of self-mutilation. No differences in the pattern or strength of the psychological or psychophysiological response to self-mutilation between males and females were anticipated because the primary motivation described by both males and females was tension reduction.

10.1.4 Repetitive self-mutilation

Results of previous studies in this investigation have demonstrated that frequent self-mutilation participants experienced more severe symptomatology than the infrequent group and that their motivations for engaging in the behaviour were more specifically oriented towards a need to control these unpleasant symptoms, particularly tension. As noted, the tension reduction model has indicated that a repetitive pattern of self-mutilation is maintained by the internal reinforcement that the act itself provides when tension is reduced. Therefore, it makes sense to consider that the strength of the psychological and psychophysiological response would differ between frequent and infrequent self-mutilation groups.

In the present study the psychophysiological and psychological responses of frequent and infrequent self-mutilation participants to self-mutilation imagery were compared. It was hypothesised that frequent self-mutilation participants would evidence a significantly greater degree of psychophysiological arousal reduction with the act of self-mutilation and report a significantly greater level of decrease in psychological response following the act than the infrequent self-mutilation group.

10.2 METHOD

10.2.1 Participants

The eighty-eight people who participated in the second study completed the present investigation. As noted in Chapter 5, self-mutilation and control participants were matched on the basis of age, sex and imagery ability.

10.2.2 Materials

Scales

The Betts QMI Vividness of Imagery Scale (Sheehan, 1967) was used to assess imagery ability. This 35 item questionnaire was designed to measure the ability to evoke images in 7 stimulus modalities (visual, auditory, cutaneous, kinaesthetic, gustatory, olfactory, organic). Participants are required to rate the clarity of imagery evoked using a 7-point rating scale which ranged from "no image present at all" (7) to "perfectly clear and vivid" (1). The validity of this scale has been indicated by the high correlation between scores on the short form and the original form (r = .92) (Sheehan, 1967).

The Gordon Test of Visual Imagery Control (Gordon, 1949) was utilised to assess the ability to manipulate and control imagery. This is a 12 item questionnaire that requires individuals to rate their ability to visualise a series of images by answering 'yes' if able to produce the image and 'no' if unable to produce the image.

A Stimulus-Response Inventory was included to investigate between group differences in the degree and awareness of arousal to anxiety and hostility provoking events. Stimulus-Response Inventories for Anxiousness (Endler, Hunt & Rosenstein, 1962; Endler & Magnusson, 1976) and Hostility (Endler & Hunt, 1968) were modified to include only psychophysiologically relevant items.

Researchers have acknowledged that the effective investigation of emotional states requires both psychophysiological and psychological assessment (Boucsein, 1992). Visual Analogue Scales (VASs) (McCormack, Horne & Sheather, 1988) were used to determine participants' psychological response to imagery. VAS scores (from 0 to 100) represented this response on seven bipolar dimensions that related to the phenomenology of self-mutilation: relaxed/tense, relaxed/anxious, calm/angry, unafraid/afraid, happy/sad, normal/unreal, and relieved/uptight. A higher score on these dimensions represented a more negative experience. VASs also were used to assess how clearly participants could image the information presented (unclear/clear), and to determine the accuracy of the information included in the personalised imagery scripts (not close/very close). Higher scores on these dimensions represented a more positive experience.

Copies of all scales utilised in this study are included in Appendix H.

Imagery scripts

Self-mutilation participants were interviewed to collect information for personalised imagery scripts for 4 separate events: (a) a self-mutilative episode; (b) an accidental injury (e.g., accident with kitchen knife); (c) an angry interaction (e.g., argument with significant other); and (d) a low arousal neutral event (e.g., making a cup of coffee). Separate scripts detailing information relevant to the individual were written for each event for each participant. Control participants were interviewed regarding an accidental injury, anger and neutral event only. As scripts detailed events that individuals had actually experienced, the control participants did not receive a self-mutilation script. Control scripts and the control group were included to ensure that individuals who self-mutilate did not respond aberrantly to events that are experienced by most people.

It may be suggested that in using guided imagery it is possible to direct participants to respond to imagery in a particular way. Previous research regarding this guided imagery methodology examined the utility of administering a standard self-mutilation imagery script describing tension reduction to non-mutilating participants (Haines, Williams, Brain et al., 1995). Results indicated that a tension reduction response pattern to self-mutilation imagery could not be elicited in those who had never engaged in the behaviour. Participants' responses to this standard imagery were generally a function of the ability to image a behaviour in which they had never engaged, or the degree to which they felt comfortable

thinking about inflicting injury on themselves (Haines, Williams, Brain et al., 1995). Whatever the reason, the response of individuals who had never self-mutilated to standard self-mutilation imagery was markedly different from the response elicited by self-mutilation participants.

For the present study, all participants were asked to discuss the information for the personalised imagery scripts in terms of the environment in which the event occurred, their behaviour, and their emotional, cognitive and psychophysiological reactions. The information discussed was limited to the moments immediately preceding the event, the actual event and the moments immediately following the event. Using this information, guided imagery scripts presenting a chronological sequence of events were devised. Only elements reported by the individual were included in the imagery scripts in the wording used by the participants (Haines, Williams, Brain et al., 1995). In this way, participants were not directed to experience reactions they had not previously recalled.

Each imagery script was comprised of four distinct stages: (1) setting the scene (a description of the environment in which the incident occurred and the context of the situation); (2) approach to the behaviour (description of events immediately preceding the incident; (3) the incident (details of the actual event as it occurred); and (4) the consequence (description of the events immediately following the incident and the resolution phase). As mentioned, information regarding the individual's thoughts, feelings and

actions was included in each stage. An example of each script type is depicted in Appendix I.

Apparatus and psychophysiological recording

Measurement of psychophysiological responses was facilitated using Chart 3.4 on a Macintosh Quadra 840AV computer linked to a MacLab/8 Data Acquisition System. Recordings were made at 1mm/s-1, with a sampling frequency of 200 sample/s-1.

Measurements were taken for finger pulse amplitude (FPA), electrocardiograph (ECG) integrated to obtain a mean heart rate (HR), electromyogram (EMG), respiration (RESP) and skin conductance level (SCL). These measures were selected to incorporate a range of psychophysiological responses to account for the idiosyncratic nature of participants' responses to imagery (Fleming & Baum, 1987). Indeed, it has been suggested that individuals elicit multiple patterns of arousal depending on the emotion being experienced or processed (Levenson, 1988).

FPA was measured via a plethysmograph attached to the second finger of the non-dominant hand. ECG was measured using 2 Gereonics 7-mm Ag/AgCl electrodes fitted at the second rib on both sides of the torso. The electrode diameter represented paste contact (ECI Electro-Gel) with skin. One miniature Gereonics Ag/AgCl electrode placed at the left mastoid process served as an earth reference. Frontalis EMG was measured using two miniature Gereonics Ag/AgCl electrodes placed in the left mid-pupillary line at

positions one third and two thirds above the supra-orbital margin. RESP was recorded using a Pneumotrace respiration sensor band fitted around the upper torso. SCL was measured via 2 Med Associate 10-mm Ag/AgCl cup electrodes connected to the fingertips of the first and third fingers of the non-dominant hand. FPA and SCL were taken using the non-dominant hand as it has been reported that anxiety is a reflection of non-dominant brain hemisphere activity (Brende, 1982).

10.2.3 Procedure

Participants were interviewed regarding information for imagery script inclusion and questionnaires were completed at this time. Imagery scripts were constructed by the experimenter in the intervening period between the interview and the laboratory session. At the laboratory session, electrodes were applied and participants were instructed to keep their eyes closed while a one minute pre-imagery baseline measure of psychophysiological responses was taken. Participants were asked to keep their eyes closed during imagery presentation and to concentrate on imaging details currently being described. Following baseline, each stage of the four stage imagery script was presented. Each stage was approximately 60 seconds in duration. There was a 10 second pause between stages at which time participants were permitted to open their eyes. This between stage pause was kept brief to allow continuity of imagery.

Scripts were presented in a counter-balanced order to prevent problems of adaptation-habituation.

After the presentation of each script, participants completed VASs, rating their subjective responses to each stage of that script. To facilitate this process, participants were reminded of key elements of each stage prior to rating that stage.

Each step of the procedure was carefully explained before it occurred and each participant was debriefed at the conclusion of the recording session.

10.2.4 Transformation and scoring of psychophysiological data

Scores were extracted for a 30 second pre-imagery baseline recording and for a 30 second period of each stage of each imagery script. This scoring period was generally taken 15-20 seconds into each stage and was based on script content. This scoring method has been used successfully in previous research (Brain et al., in press, 1998; Carson et al., in press; Driscoll et al., 1997; Driscoll et al., 1996; Haines, Brain & Williams, 1997; Haines, Josephs et al., 1998; Haines, Williams, Brain et al., 1995; McLaren et al., 1996; Williams et al., 1995; Wells et al., in press).

Mean psychophysiological responses were calculated for HR and SCL. Number of breaths per minute were counted for RESP. Change scores were calculated for FPA by subtracting the scores obtained during each stage from baseline and dividing by the baseline measure. SCL data was obtained for fewer participants (n =

54) due to problems with the recording equipment on this channel. EMG data was discarded due to difficulties with recording on this channel caused by a programming fault on this version of the Chart software.

10.3 RESULTS

A proportion of the results outlined in the following section have been published (Brain et al., in press, 1998).

10.3.1 Overview

For S-R Inventory data, between group (current self-mutilation, recovered self-mutilation, control; frequent self-mutilation, infrequent self-mutilation, control; and male self-mutilation, female self-mutilation, male control, female control) ANOVAs were conducted for each response type to determine if any significant differences between the groups in terms of perceived psychophysiological response to anxious and hostile situations were evident.

VAS measures assessing accuracy of script content and clarity of imagery were included as control measures to ensure that subsequent results were not effected by these variables.

For psychophysiological and VAS data, analyses of variance (ANOVAs) were conducted and a Huynh-Feldt correction applied. Initial group (self-mutilation, control) x script (accidental injury, anger, neutral) x stage (scene, approach, incident, consequence)

ANOVAs investigated between group differences in response to imagery. As previously mentioned, control scripts and the control group were included in this investigation to ensure that individuals who self-mutilate did not respond aberrantly to events that are experienced by most people.

Within group analyses of the total sample of self-mutilation participants' psychophysiological and VAS data were used to test the tension reduction model of self-mutilation. Script (self-mutilation, accidental injury, anger, neutral) x stage (scene, approach, incident, consequence) ANOVAs were applied to determine how psychophysiological and subjective response patterns to self-mutilation and control events differed.

It was of interest from a methodological point of view, to determine whether any differences in response to self-mutilation imagery existed between participants who were currently self-mutilating and the recovered self-mutilation sample. Group (current self-mutilation, recovered self-mutilation) x stage (scene, approach, incident, consequence) ANOVAs were conducted for the self-mutilation script to determine whether there was any difference in the strength of the arousal pattern associated with the act of self-mutilation between those who had not self-mutilated for more than six months and those who were currently engaging in the behaviour.

Sex (male, female) x stage (scene, approach, incident, consequence) ANOVAs were utilised to determine any sex differences in response to self-mutilation imagery.

Group (frequent self-mutilation, infrequent self-mutilation) x stage (scene, approach, incident, consequence) ANOVAs were conducted to investigate any differences in the strength of psychological and psychophysiological response to self-mutilation imagery between frequent and infrequent self-mutilation participants.

Although a high number of ANOVAs were conducted in this investigation, the ratio of participants to dependent variables prevented the reliable use of MANOVA (Tabachnick & Fidell, 1989).

10.3.2 S-R Inventories

Mean scores and standard deviations for all groups for the S-R Inventories are presented in Appendix J. Although significant between group differences were noted, inspection of the mean scores demonstrated that ratings for all groups on these measures were quite low indicating that the responses for all participants were within a normal range of experience. These between group differences are described in Appendix J.

10.3.3 Total sample response to imagery

There was no significant difference between the self-mutilation and control groups in terms of imagery ability or the ability to manipulate or control imaged information. Mean scores and standard deviations for both groups for imagery questionnaires are presented in Appendix K.

Clarity of imagery and accuracy of script content

No significant differences between self-mutilation and control groups were evident for the VAS measures clear/unclear and not close/very close. This indicated that other results were not affected by these variables. Means and standard deviations for each stage of each control script for the self-mutilation and control groups are illustrated in Appendix K. Inspection of mean scores has indicated a high degree of clarity of imagery and accuracy of script content for each stage of each script.

A significant script (accidental injury, anger, neutral) x stage (scene, approach, incident, consequence) interaction was demonstrated for the total sample for unclear/clear, F (6, 504) = 2.65, $p < .05$. Means and standard deviations for unclear/clear and not close/very close for the total sample of participants for each stage of each script are depicted in Appendix K. Post hoc comparisons indicated that the neutral script was imaged significantly more clearly than the accidental injury and anger scripts at stages 1, 2 and 4. Details of these post hoc comparisons are presented in Appendix L.

A significant main effect for script for noted for not close/very close for the total sample of participants, F (2, 84) = 4.84, $p < .05$. Post hoc analyses indicated that information included in the neutral scripts was rated as significantly more accurate than the information included in the accidental injury script (Fisher LSD = 2.31, $p < .05$). For the self-mutilation group, a significant main effect was demonstrated for script for unclear/clear, F (3, 120) = 3.35, $p < .05$, and

not close/very close, F (3, 120) = 4.57, $p < .01$. Post hoc analyses indicated that the neutral script was imaged significantly more clearly than the self-mutilation, accidental injury and anger scripts (Fisher LSD = 3.73, $p < .05$). In addition, participants rated the neutral and the anger scripts as significantly closer to real life than the self-mutilation script (Fisher LSD = 3.43, $p < .05$). It is likely that these results are due to the familiarity of neutral script events. As previously mentioned, information included in all imagery scripts received high accuracy ratings.

Between group psychophysiological response to control imagery

Group (self-mutilation, control) x script (accidental injury, anger, neutral) x stage (scene, approach, incident, consequence) ANOVAs were conducted for each of the psychophysiological measures. Mean scores and standard deviations for FPA, HR, RESP and SCL for each stage of the control scripts for the self-mutilation and control groups are presented in Appendix M.

No significant between group differences were demonstrated between the self-mutilation and control groups for control scripts for any of the psychophysiological measures. This indicated that the self-mutilation participants' psychophysiological responses to the imaged control events were appropriate.

Total sample psychophysiological response to control imagery

Significant script (accidental injury, anger, neutral) x stage (scene, approach, incident, consequence) interactions were demonstrated for FPA, F (6, 426) = 7.70, $p < .0001$; HR, F (6, 492) = 5.48, $p < .001$; and RESP, F (6, 468) = 5.13, $p < .0001$. No significant script x stage interaction was demonstrated for SCL. However, the pattern of arousal depicted across the four stages of each script for SCL was similar to that demonstrated for other psychophysiological measures. For SCL there was a significant main effect for script, F (2, 76) = 4.56, $p < .02$. Post hoc comparisons demonstrated that the accidental injury and anger scripts were associated with higher levels of SCL than the neutral script (Fisher LSD = 1.06, $p < .05$). Post hoc comparisons between stages for each script and between scripts at each stage for the total sample of participants are presented in Appendix N.

Between group VAS response to control imagery

Group (self-mutilation, control) x script (accidental injury, anger, neutral) x stage (scene, approach, incident, consequence) ANOVAs were conducted for each of the VAS measures to determine if there were any differences in the groups' subjective responses to control imagery. Means and standard deviations for each stage of each of the control scripts for the self-mutilation and control groups are presented in Appendix O.

Significant group (self-mutilation, control) x script (accidental injury, anger, neutral) x stage (scene setting, approach, incident,

consequence) interactions were demonstrated for 5 of the 7 VAS measures: relaxed/tense, F (6, 504) = 13.17, $p < .0001$; relaxed/anxious, F (6, 504) = 8.77, $p < .0001$; calm/angry, F (6, 504) = 10.90, $p < .0001$; happy/sad, F (6, 504) = 5.92, $p < .0001$; relieved/uptight, F (6, 504) = 2.80, $p < .05$. No significant differences between self-mutilation and control groups were evident for unafraid/afraid and normal/unreal.

Accidental injury script. A significant group x stage interaction was evident for the accidental injury script for relaxed/anxious, F (3, 258) = 10.97, $p < .001$. The self-mutilation group reported feeling significantly more anxious than the control group during stage 3, F (1, 86) = 13.85, $p < .001$; and stage 4, F (1, 86) = 8.10, $p < .006$.

Anger script. A significant group x stage interaction was demonstrated in response to the anger script for relaxed/tense, F (3, 252) = 9.20, $p < .0001$; calm/angry, F (3, 252) = 8.50, $p < .001$; and happy/sad, F (3, 252) = 6.14, $p < .002$. No significant differences between the groups were demonstrated at stage 1. The self-mutilation group reported significantly higher levels of negative feeling than the control group at stage 2: relaxed/tense, F (1, 84) = 26.54, $p < .0001$; calm/angry, F (1, 84) = 23.21, $p < .0001$; happy/sad, F (1, 84) = 11.98, $p < .001$; stage 3: relaxed/tense, F (1, 84) = 34.55, $p < .0001$; calm/angry, F (1, 84) = 33.55, $p < .0001$; happy/sad, F (1, 84) = 25.17, $p < .0001$; and stage 4: relaxed/tense, F (1, 84) = 22.18, $p < .0001$; calm/angry, F (1, 84) = 18.85, $p < .0001$; happy/sad, F (1, 84) = 10.35, $p < .002$.

A significant main effect for group was demonstrated for the anger script for relaxed/anxious, F (1, 84) = 7.51, p < .01; and relieved/uptight, F (1, 84) = 11.23, p < .002). Inspection of mean scores indicated that self-mutilation participants reported feeling significantly higher levels of negative feeling than the control group for the anger script.

Neutral script. A significant group x stage interaction was evident for the neutral script for relaxed/tense, F (3, 258) = 17.71, p < .0001; relaxed/anxious, F (3, 258) = 2.93, p < .05; and calm/angry, F (3, 258) = 18.98, p < .0001. The self-mutilation group reported feeling significantly more relaxed than the control group at stage 1 for relaxed/anxious, F (1,86) = 5.61, p < .05. Significantly lower levels of negative feeling were evident for the self-mutilation group than the control group at stage 2: relaxed/tense F (1, 86) = 4.54, p < .05; relaxed/anxious, F (1, 86) = 5.37, p < .05; calm/angry, F (1, 86) = 4.11, p < .05; stage 3: relaxed/tense, F (1, 86) = 22.45, p < .0001; calm/angry, F (1, 86) = 27.03, p < .0001; and stage 4: relaxed/tense, F (1, 86) = 26.50, p < .0001; calm/angry, F (1, 86) = 23.00, p < .0001.

A significant main effect for group was noted for relieved/uptight for the neutral script, F (1, 86) = 25.15, p < .0001. The self-mutilation group (M = 59.30, SD = 26.31) reported feeling significantly more relieved than the control group (M = 35.73, SD = 26.31) during neutral imagery.

In summary, some between group differences were evident for 5 of the VAS measures. Self-mutilation participants reported

significantly higher levels of negative feeling for the anger script at stages 2, 3 and 4 than the control group. For the neutral script, self-mutilation participants reported feeling significantly more positive than the control group for most measures. Differences in intensity of response between groups was noted at some stages for some measures, but the pattern of subjective feeling reported by the two groups across the four stages of each of the control scripts was similar. This is illustrated in Figures 20, 21 and 22.

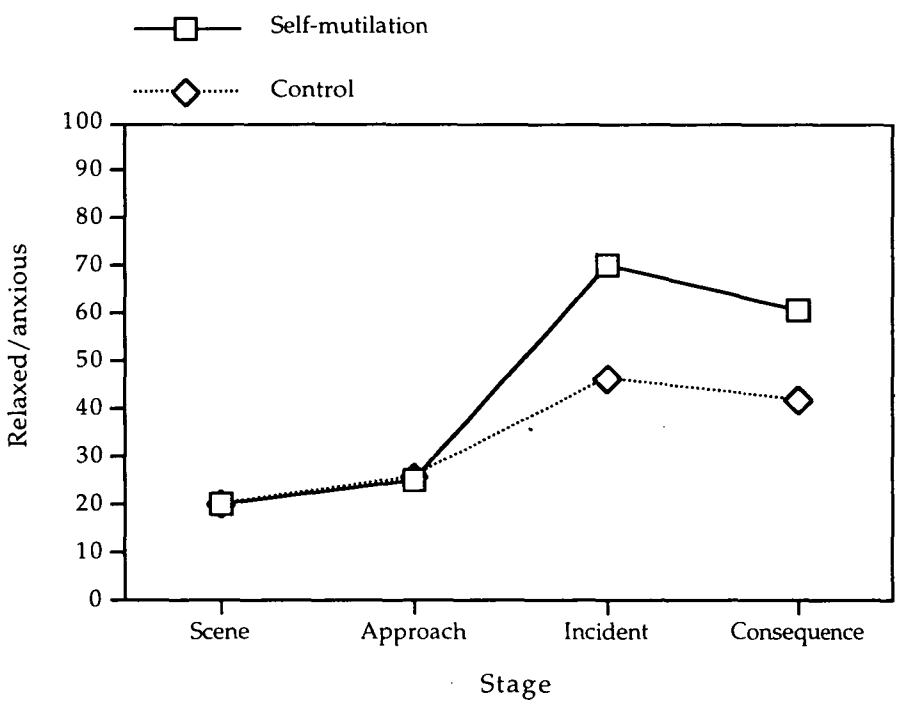


Figure 20. The pattern of response across the four stages of the accidental injury script for self-mutilation and control groups for the VAS measure relaxed/anxious.

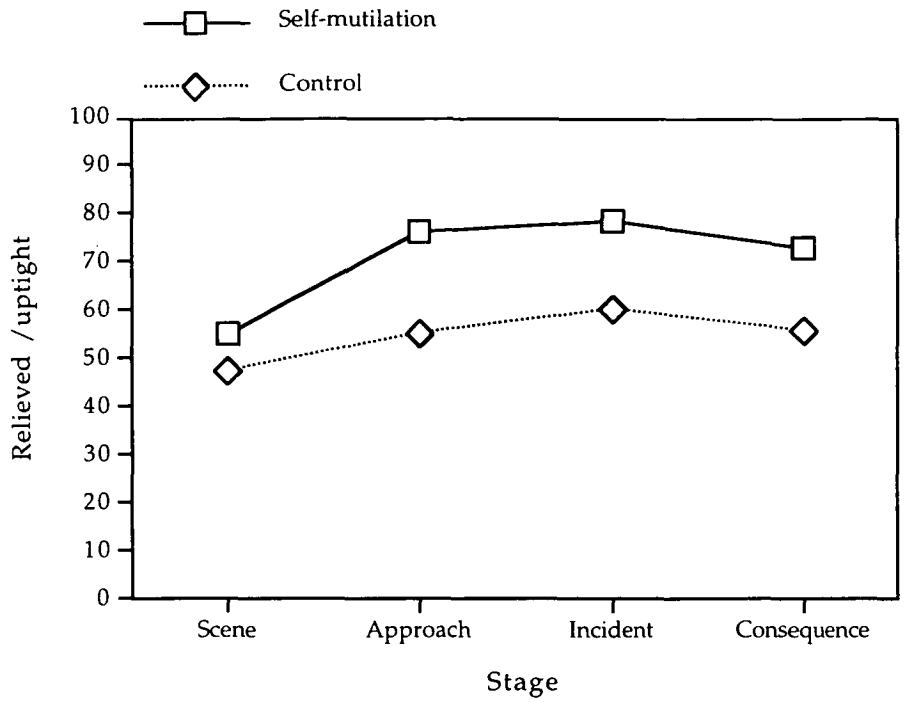


Figure 21. The pattern of response across the four stages of the anger script for self-mutilation and control groups for the VAS measure relieved/uptight.

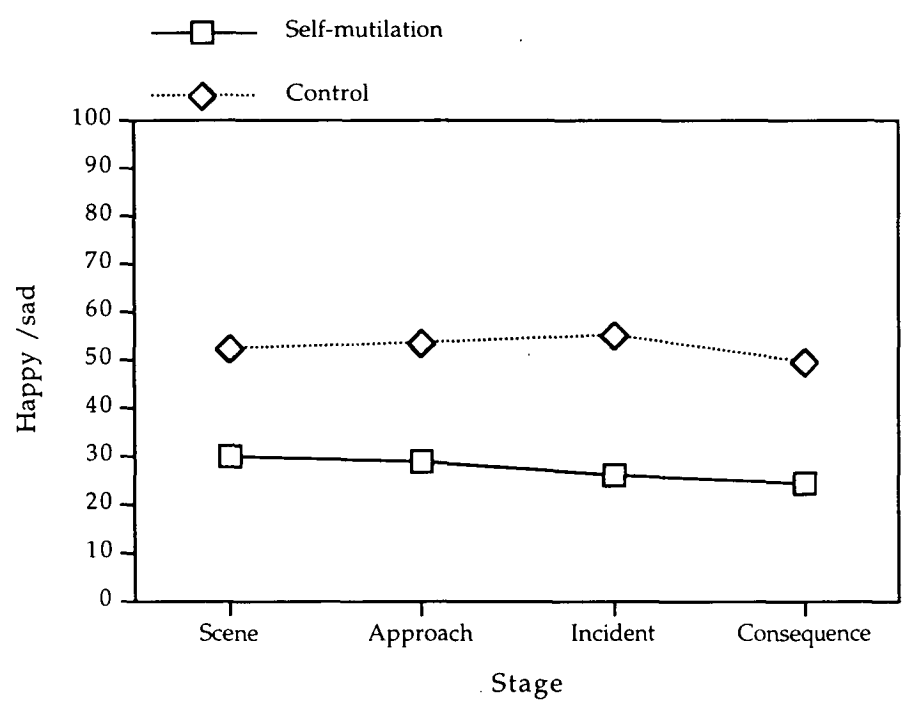


Figure 22. The pattern of response across the four stages of the neutral script for self-mutilation and control groups for the VAS measure happy/sad.

Total sample VAS response to control imagery

Significant script (accidental injury, anger, neutral) x stage (scene, approach, incident, consequence) interactions were demonstrated for all VAS measures: relaxed/tense, F (6, 504) = 38.88, $p < .0001$; relaxed/anxious, F (6, 504) = 8.77, $p < .0001$; calm/angry, F (6, 504) = 24.79, $p < .0001$; unafraid/afraid, F (6, 504) = 18.56, $p < .0001$; happy/sad, F (6, 504) = 5.92, $p < .0001$; normal/unreal, F (6, 504) = 26.49, $p < .0001$; and relieved/uptight, F (6, 504) = 24.44, $p < .0001$. Post hoc comparisons between stages for each script and between scripts at each stage are presented in Appendix P.

10.3.4 Self-mutilation group response to imagery

Comparison of psychophysiological response between scripts

Within group ANOVAs for the total sample of self-mutilation participants were utilised to determine any differences in psychophysiological response to self-mutilation and control imagery scripts. Significant script x stage interactions for the 4 psychophysiological measures were evident: FPA, F (9, 306) = 4.44, $p < 003$; HR, F (9, 360) = 5.35, $p < .003$; RESP, F (9, 342) = 9.10, $p < .0001$; SCL, F (9, 207) = 3.76, $p < .003$. Post hoc analyses comparing self-mutilation and control scripts only are described in this section. Post hoc results for comparisons between control scripts are presented in Appendix Q.

The pattern of arousal elicited across the four stages of the self-mutilation script compared with accidental injury, anger and neutral

scripts for each of the psychophysiological measures are illustrated in Figures 23, 24, 25 and 26.

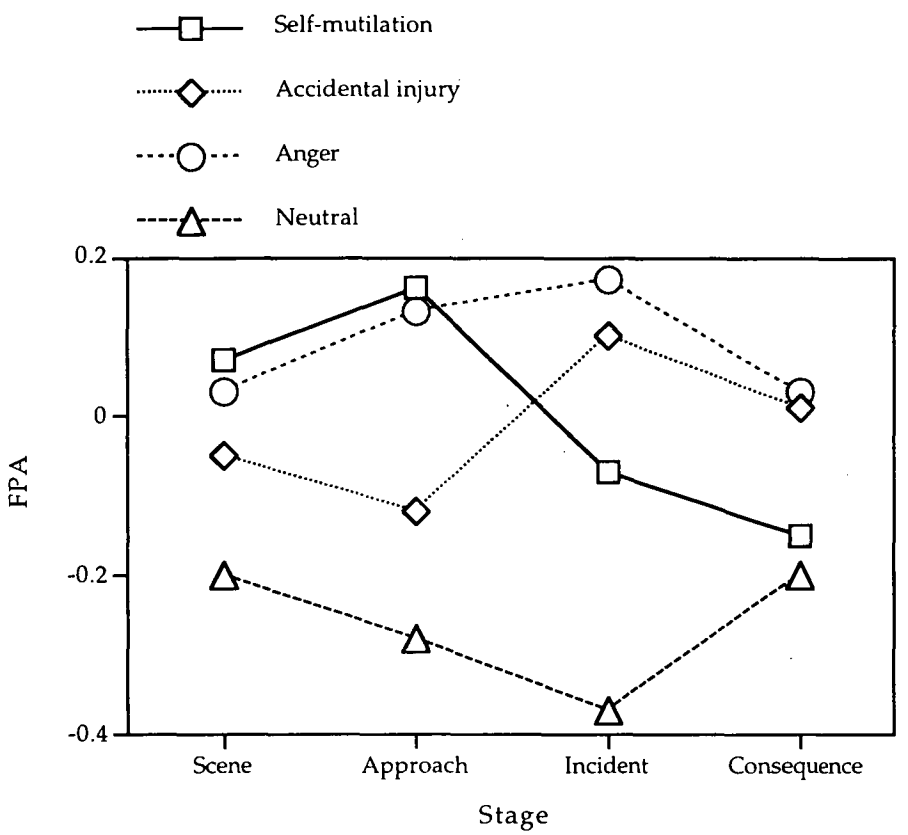


Figure 23. Variation in FPA across the four stages of the four scripts for the self-mutilation group.

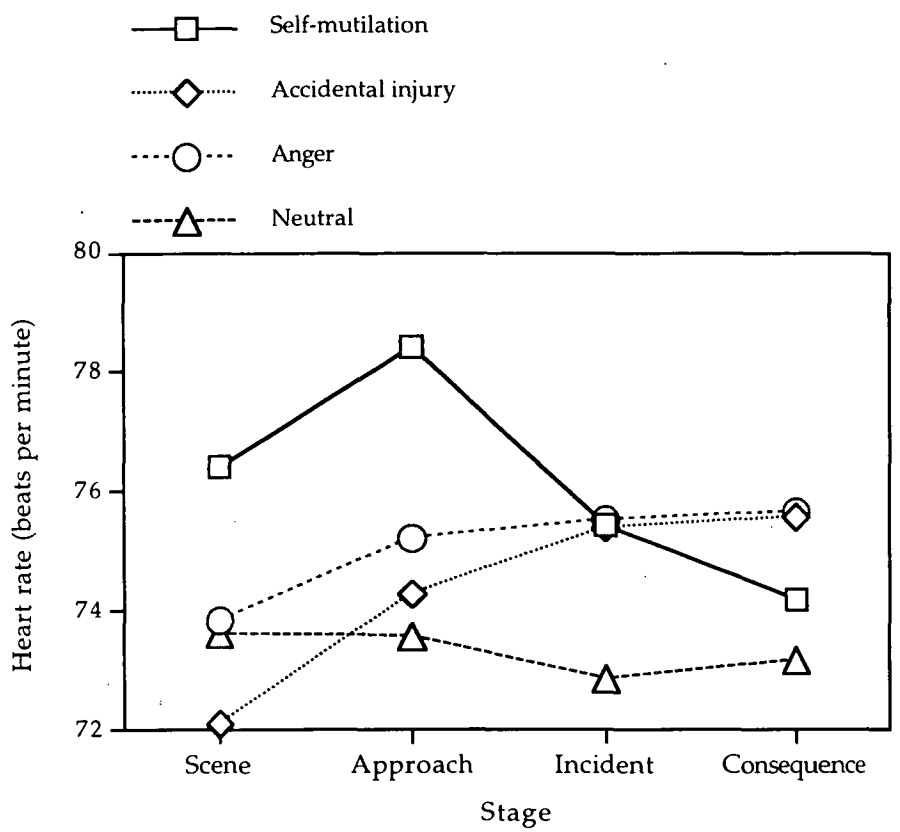


Figure 24. Variation in HR across the four stages of the four scripts for the self-mutilation group.

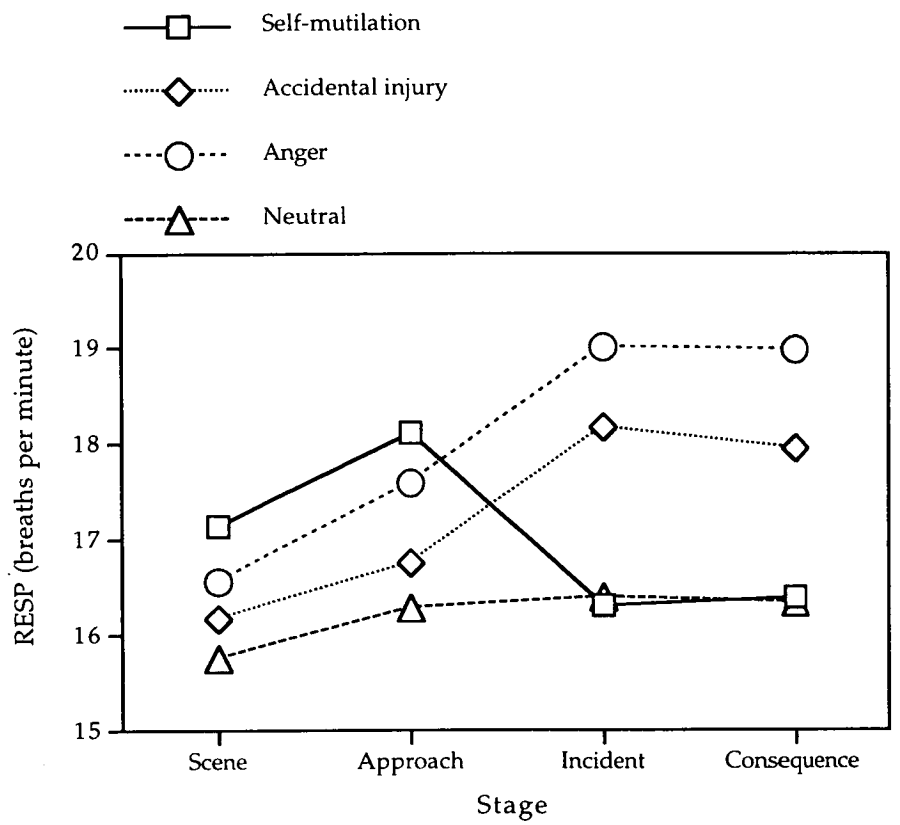


Figure 25. Variation in RESP across the four stages of the four scripts for the self-mutilation group.

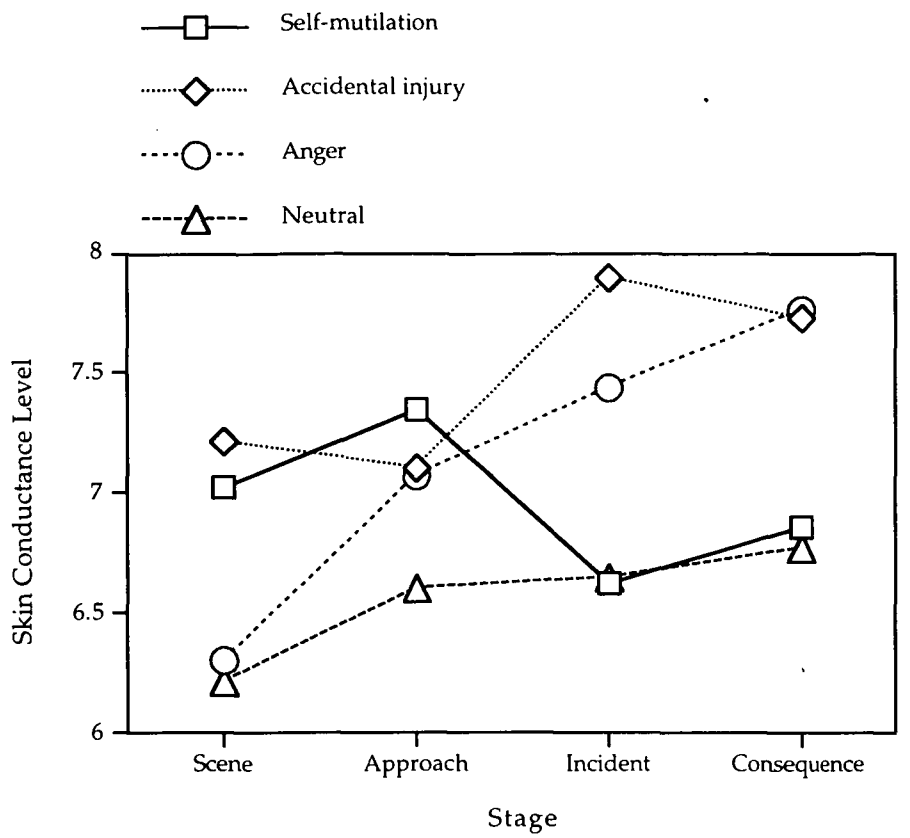


Figure 26. Variation in SCL across the four stages of the four scripts for the self-mutilation group.

A significant main effect for script was demonstrated at stage 1 for FPA, F (3, 105) = 5.86, $p < .001$; HR, F (3, 123) = 3.17, $p < .05$); and RESP, F (3, 117) = 3.67, $p < .05$. At stage 1, arousal was significantly higher for the self-mutilation script than the neutral script for FPA (Fisher LSD = 0.14, $p < .05$) and RESP (Fisher LSD = 0.86, $p < .05$) and significantly higher than the accidental injury script for HR (Fisher LSD = 2.78, $p < .05$) and RESP (Fisher LSD = 0.86, $p < .05$). No significant difference between the self-mutilation script and anger script was noted at stage 1 for any of the psychophysiological measures.

A significant main effect for script was evident for stage 2 for FPA, F (3, 105) = 11.54, $p < .0001$; HR, F (3, 123) = 7.47, $p < .0001$; and RESP, F (3, 117) = 5.86, $p < .001$. Arousal was significantly higher at stage 2 of self-mutilation imagery than at stage 2 of accidental injury and neutral scripts: FPA (Fisher LSD = 0.18, $p < .05$), HR (Fisher LSD = 2.20, $p < .05$), and RESP (Fisher LSD = 0.91, $p < .05$). A significant difference between the self-mutilation and anger script was indicated at stage 2 for HR only. HR was significantly higher at this stage of the self-mutilation than the anger script.

A significant main effect for script was evident at stage 3 for FPA, F (3, 105) = 11.61, $p < .0001$; HR, F (3, 123) = 3.68, $p < .05$; and RESP, F (3, 117) = 13.93, $p < .0001$. Arousal was significantly lower at stage 3 of the self-mutilation script than at stage 3 of the accidental injury script for RESP (Fisher LSD = 0.95, $p < .05$). At stage 3, arousal was significantly lower for the self-mutilation script than the anger script for FPA (Fisher LSD = 0.20, $p < .05$) and RESP (Fisher LSD = 0.95, $p < .05$). Arousal was significantly higher for the self-mutilation script than the neutral script at stage 3 for FPA (Fisher LSD = 0.20, $p < .05$) and HR (Fisher LSD = 1.97, $p < .05$).

A significant main effect for script was evident at stage 4 for HR, F (3, 123) = 4.25, $p < .007$; and RESP, F (3, 117) = 11.75, $p < .0001$. At stage 4, arousal was significantly lower for the self-mutilation script than the accidental injury script for RESP (Fisher LSD = 1.04, $p < .05$). Arousal was significantly lower for the self-mutilation script than the anger script during this final stage of imagery for HR (Fisher

LSD = 1.75, $p < .05$) and RESP (Fisher LSD = 1.04, $p < .05$). No significant difference between the self-mutilation and neutral scripts was demonstrated at stage 4 for any of the psychophysiological measures.

Comparison of VAS response between scripts

Within group ANOVAs were conducted to investigate any differences in self-mutilation participants' subjective responses to self-mutilation and control imagery scripts. Significant script x stage interactions were evident for all VAS measures: relaxed/tense, F (9, 360) = 40.40, $p < .0001$; relaxed/anxious, F (9, 360) = 33.67, $p < .0001$; calm/angry, F (9, 360) = 35.62, $p < .0001$; unafraid/afraid, F (9, 360) = 10.20, $p < .0001$; happy/sad, F (9, 360) = 21.13, $p < .0001$; normal/unreal, F (9, 360) = 9.15, $p < .0001$; and relieved/uptight, F (9, 360) = 19.42, $p < .0001$.

Post hoc comparisons between the self-mutilation and control scripts only are described in this section. Between script comparisons for control scripts at each stage are presented in Appendix P. Comparison between the pattern of response depicted across the four stages of the self-mutilation and the accidental injury, anger and neutral scripts for each of the VAS measures are illustrated in Figures 27, 28, 29, 30, 31, 32 and 33.

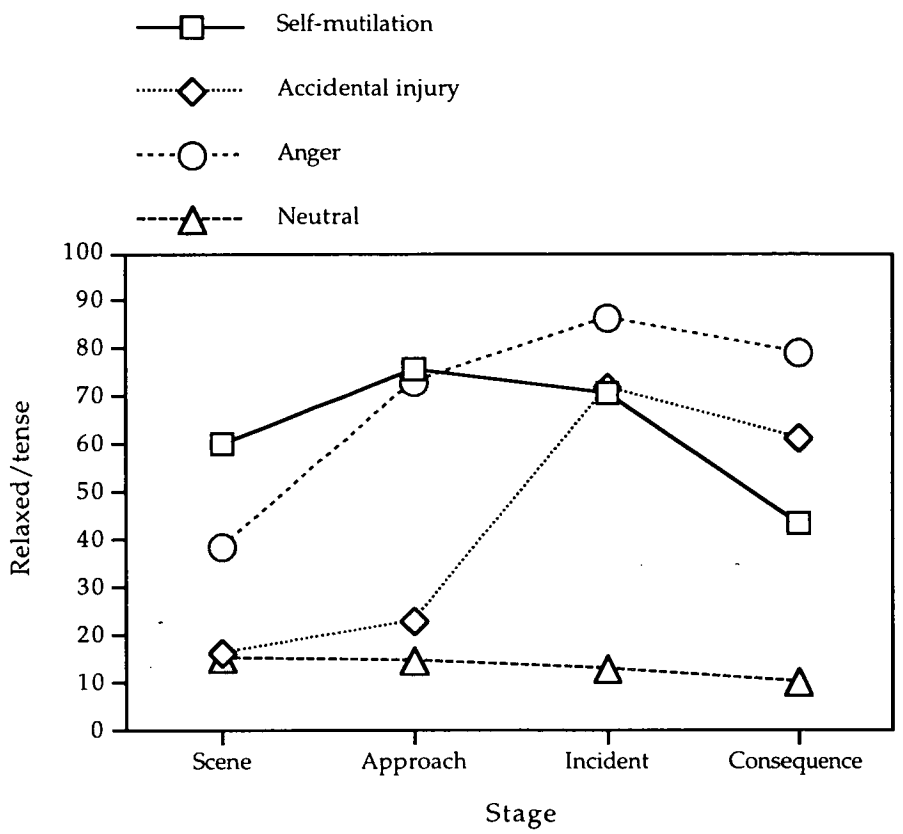


Figure 27. Variation in response across the four stages of the four scripts for the self-mutilation group for the VAS measure relaxed/tense.

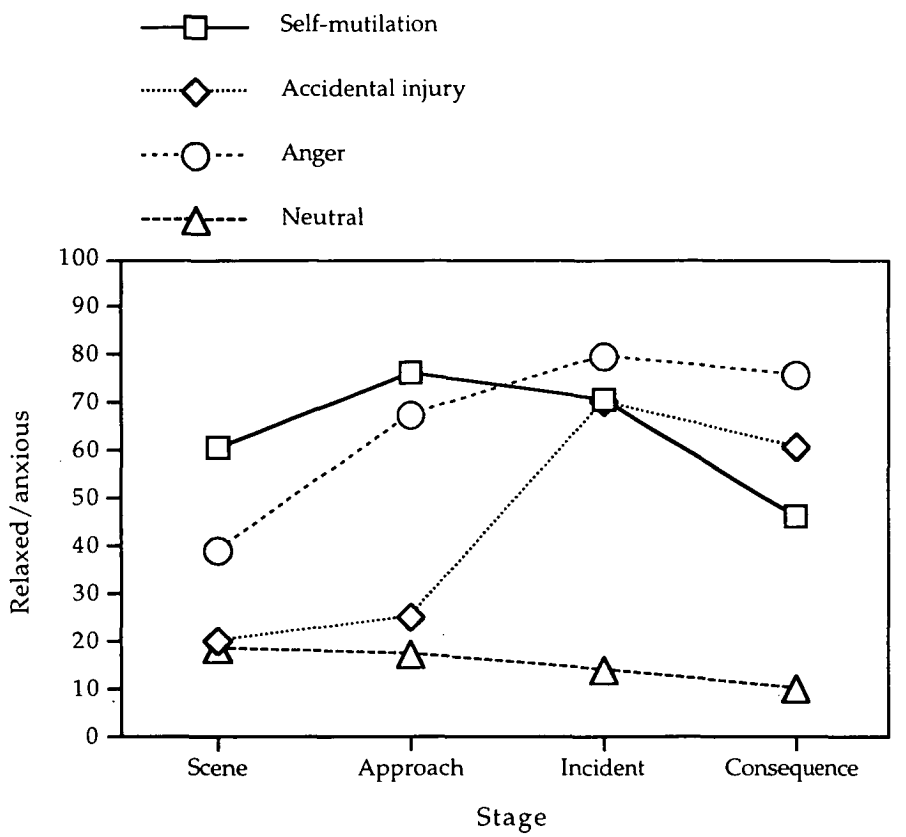


Figure 28. Variation in response across the four stages of the four scripts for the self-mutilation group for the VAS measure relaxed/anxious.

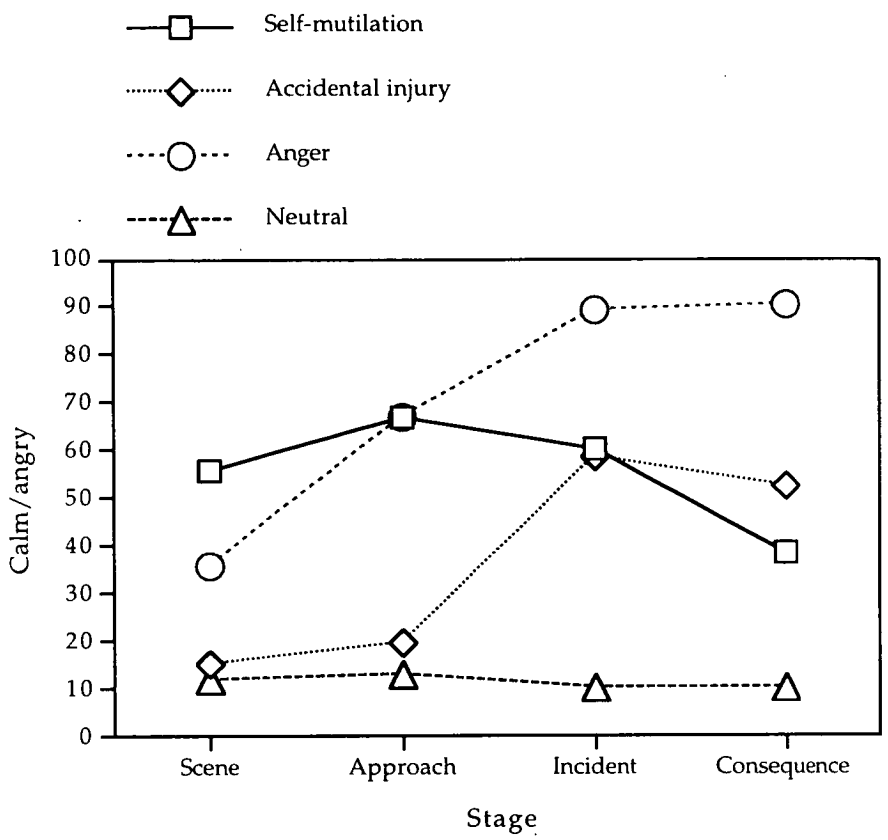


Figure 29. Variation in response across the four stages of the four scripts for self-mutilation participants for the VAS measure calm/angry.

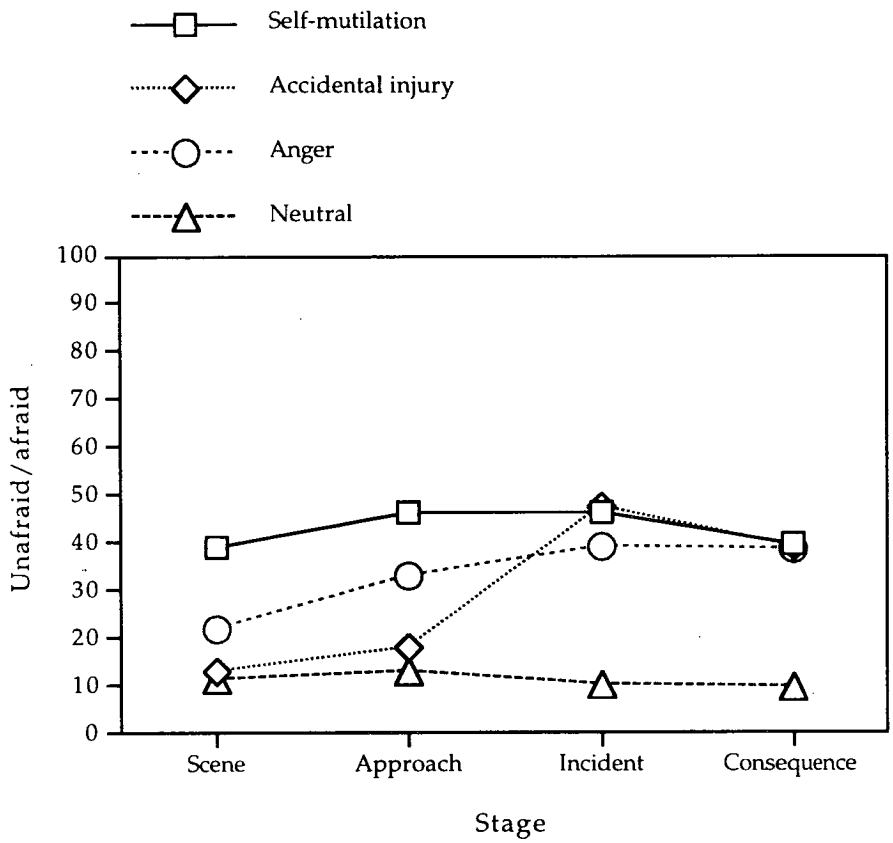


Figure 30. Variation in response across the four stages of the four scripts for self-mutilation participants for the VAS measure unafraid/afraid.

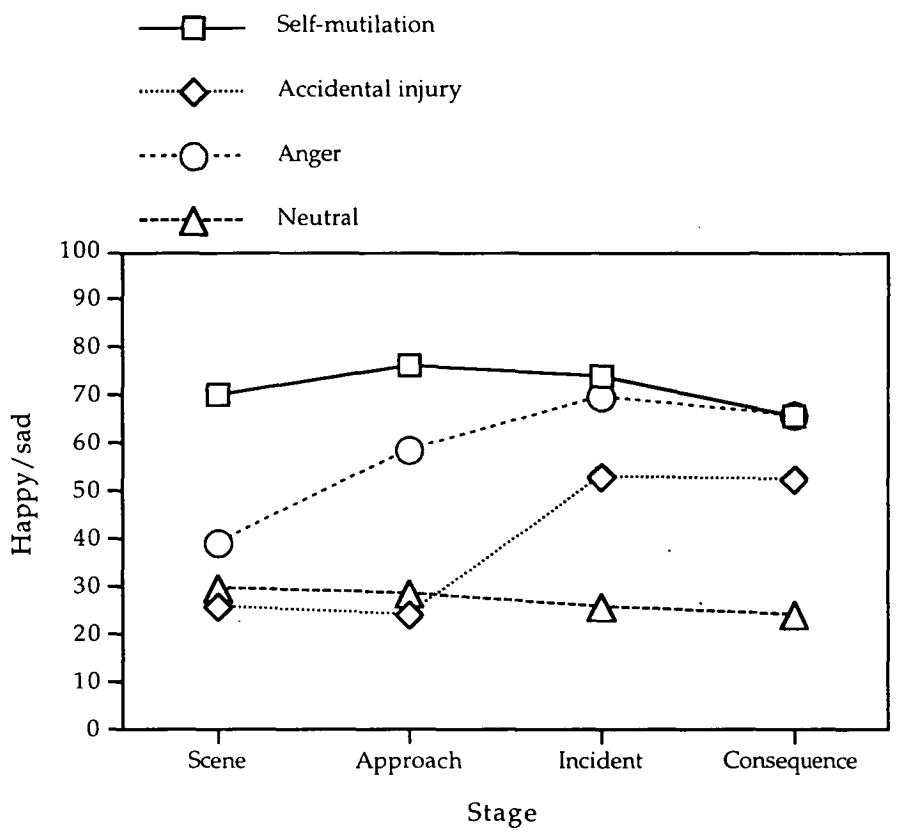


Figure 31. Variation in response across the four stages of the four scripts for self-mutilation participants for the VAS measure happy/sad.

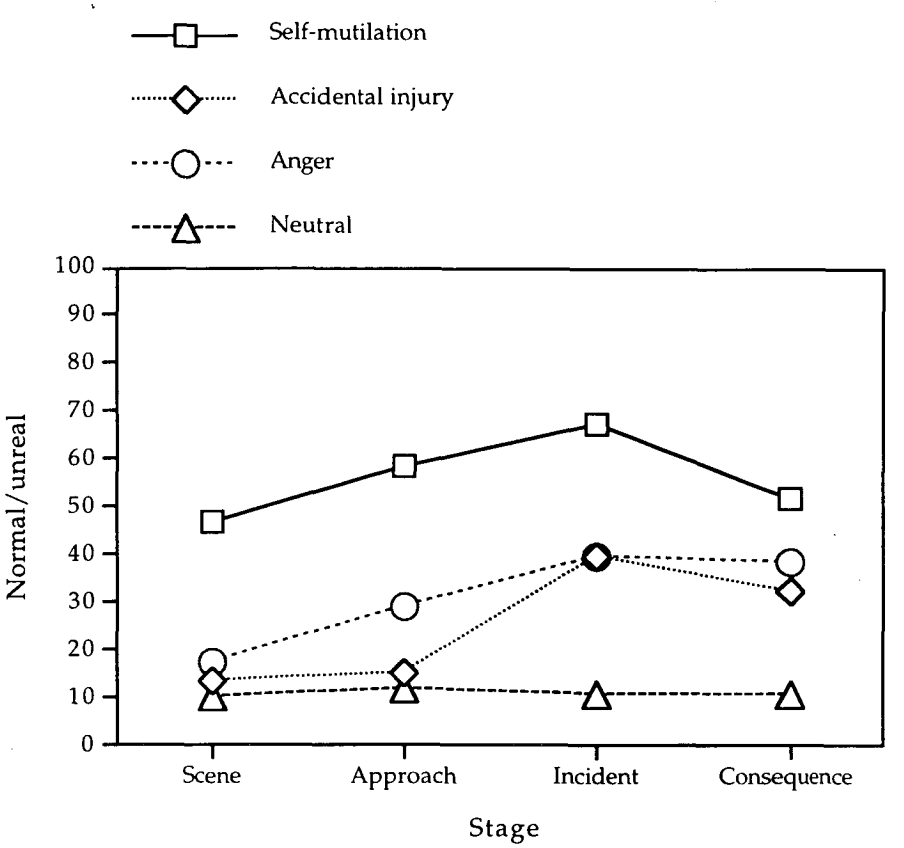


Figure 32. Variation in response across the four stages of the four scripts for self-mutilation participants for the VAS measure normal/unreal.

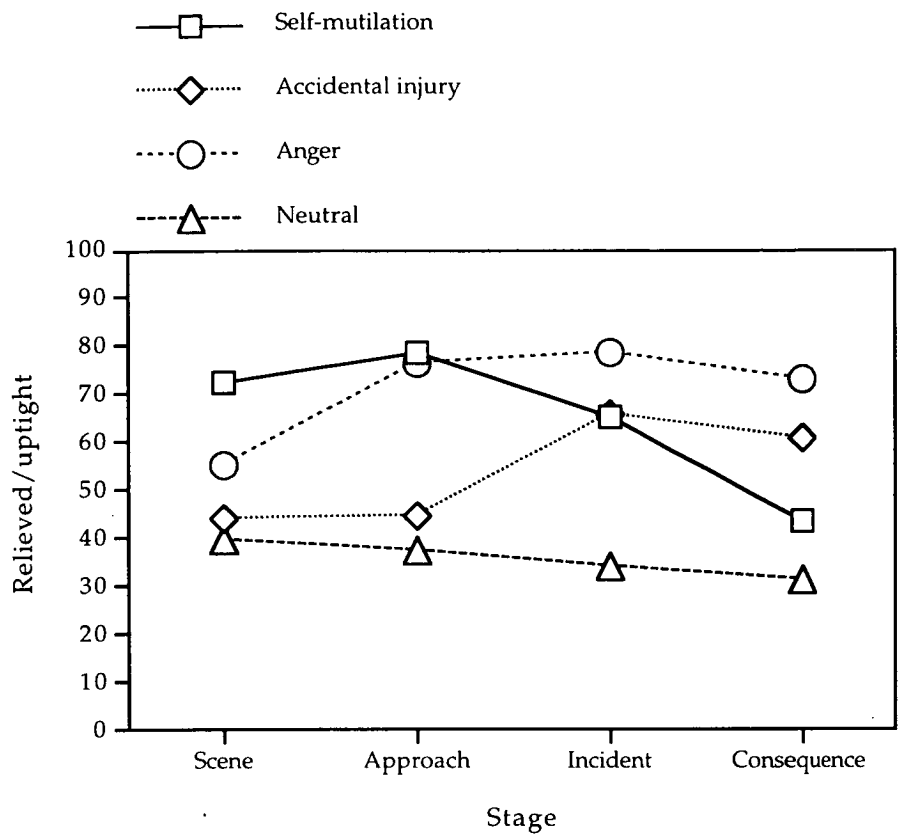


Figure 33. Variation in response across the four stages of the four scripts for self-mutilation participants for the VAS measure relieved/uptight.

A significant main effect for script was demonstrated at stage 1 for all measures: relaxed/tense, F (3, 123) = 44.17, $p < .05$; relaxed/anxious, F (3, 123) = 34.21, $p < .0001$; calm/angry, F (3, 123) = 37.08, $p < .0001$; unafraid/afraid, F (3, 123) = 22.92, $p < .0001$; happy/sad, F (3, 123) = 43.36, $p < .0001$; normal/unreal, F (3, 123) = 36.02, $p < .0001$; and relieved/uptight, F (3, 123) = 31.68, $p < .0001$. Participants reported feeling significantly more tense at stage 1 of the self-mutilation script than at stage 1 of the accidental injury, anger and neutral scripts for relaxed/tense (Fisher LSD = 9.43, $p < .05$), relaxed/anxious (Fisher LSD = 9.56, $p < .05$), calm/angry (Fisher LSD

= 9.73, $p < .05$), unafraid/afraid (Fisher LSD = 7.61, $p < .05$), happy/sad (Fisher LSD = 8.60, $p < .05$), normal/unreal (Fisher LSD = 7.83, $p < .05$) and relieved/uptight (Fisher LSD = 7.54, $p < .05$).

A significant main effect for script also was demonstrated at stage 2: relaxed/tense, F (3, 123) = 104.62, $p < .05$; relaxed/anxious, F (3, 123) = 100.99, $p < .0001$; calm/angry, F (3, 123) = 37.08, $p < .0001$; unafraid/afraid, F (3, 123) = 18.23, $p < .0001$; happy/sad, F (3, 123) = 72.18, $p < .0001$; normal/unreal, F (3, 123) = 45.29, $p < .0001$; and relieved/uptight, F (3, 123) = 59.24, $p < .0001$. At stage 2, unpleasant response for the self-mutilation script was significantly higher than for accidental injury and neutral scripts for all measures: relaxed/tense (Fisher LSD = 8.98, $p < .05$); relaxed/anxious (Fisher LSD = 65.16, $p < .05$); calm/angry (Fisher LSD = 8.88, $p < .05$); unafraid/afraid (Fisher LSD = 10.01, $p < .05$); happy/sad (Fisher LSD = 8.33, $p < .05$); normal/unreal (Fisher LSD = 8.80, $p < .05$); and relieved/uptight (Fisher LSD =7.82, $p < .05$). At stage 2, participants reported significantly higher levels of negative feeling for the self-mutilation script than for the anger script for unafraid/afraid, happy/sad and normal/unreal. Comparable levels of tension were reported at stage 2 of the self-mutilation and anger scripts for other VAS measures.

A significant main effect for script was evident at stage 3 for all VAS measures: relaxed/tense, F (3, 123) = 122.61, $p < .0001$; relaxed/anxious, F (3, 123) = 120.80, $p < .0001$; calm/angry, F (3, 123) = 96.31, $p < .0001$; unafraid/afraid, F (3, 123) = 19.62, $p < .0001$;

happy/sad, F (3, 123) = 57.84, $p < .0001$; normal/unreal, F (3, 123) = 46.11, $p < .0001$; and relieved/uptight, F (3, 123) = 30.33, $p < .0001$. Reported unpleasant feelings were significantly higher at stage 3 of the self-mutilation script than at stage 3 of the neutral script for all measures: relaxed/tense (Fisher LSD = 8.36, $p < .05$); relaxed/anxious (Fisher LSD = 7.85, $p < .05$); calm/angry (Fisher LSD = 9.47, $p < .05$); unafraid/afraid (Fisher LSD = 11.23, $p < .05$); happy/sad (Fisher LSD = 8.35, $p < .05$); normal/unreal (Fisher LSD = 9.58, $p < .05$); and relieved/uptight (Fisher LSD = 10.20, $p < .05$). Reported psychological response was significantly higher for the anger script than the self-mutilation script for relaxed/tense, calm/angry and relieved/uptight. Comparable levels of psychological response were reported at stage 3 of the anger and self-mutilation scripts for relaxed/anxious, unafraid/afraid and happy/sad. For normal/unreal, participants reported higher levels of negative feeling for the self-mutilation than the anger script at stage 3. Significantly higher levels of psychological response were reported for the self-mutilation than the accidental injury script for happy/sad and normal/unreal. The level of psychological response reported at stage 3 of the self-mutilation and accidental injury scripts for other VAS measures was comparable.

A significant main effect for script was demonstrated at stage 4 for all measures: relaxed/tense, F (3, 123) = 81.05, $p < .05$; relaxed/anxious, F (3, 123) = 66.97, $p < .0001$; calm/angry, F (3, 123) = 69.27, $p < .0001$; unafraid/afraid, F (3, 123) = 16.89, $p < .0001$;

happy/sad, F (3, 123) = 38.48, $p < .0001$; normal/unreal, F (3, 123) = 25.59, $p < .0001$; and relieved/uptight, F (3, 123) = 24.47, $p < .0001$. At stage 4 of the self-mutilation script, participants reported feeling significantly more relaxed than at stage 4 of the accidental injury and anger scripts for relaxed/tense (Fisher LSD = 9.22, $p < .05$); relaxed/anxious (Fisher LSD = 9.61, $p < .05$); calm/angry (Fisher LSD = 9.87, $p < .05$); and relieved/uptight (Fisher LSD = 10.10, $p < .05$). Reported level of negative feeling was significantly higher for the self-mutilation script than for the accidental injury and anger scripts for normal/unreal (Fisher LSD = 9.56, $p < .05$) and significantly higher for the self-mutilation script than for the accidental injury script for happy/sad (Fisher LSD = 9.32, $p < .05$). Reported level of negative feeling remained significantly higher at stage 4 of the self-mutilation script than at stage 4 of the neutral script for all VAS measures.

Psychophysiological response to self-mutilation imagery

Within group ANOVAs indicated significant main effects for stage for the self-mutilation script for 3 of the 4 psychophysiological measures; FPA, F (3, 36) = 8.97, $p < .0005$; HR, F (3, 42) = 14.56, $p < .0001$; and RESP, F (3, 123) = 5.82, $p < .004$. No significant main effect for stage was evident for the self-mutilation script for SCL. However, inspection of Figure 26 demonstrates a general pattern of arousal reduction at stage 3 for the self-mutilation script, as was evident for the other psychophysiological measures.

HR increased significantly from stage 1 to stage 2 as the escalating anxiety and tension prior to self-cutting was imaged (Fisher LSD = 1.30, $p < .05$). A high level of arousal was maintained from stage 1 to stage 2 for FPA and RESP. Psychophysiological arousal decreased significantly from stage 2 to stage 3 for FPA (Fisher LSD = 0.12, $p < .05$), RESP (Fisher LSD = 0.98, $p < .05$) and HR (Fisher LSD = 1.30, $p < .05$) as actual self-cutting was imaged. This lower level of arousal was maintained at stage 4 for all measures as the consequences of self-mutilation were imaged.

VAS response to self-mutilation imagery

Within group ANOVAs indicated significant main effects for stage for the self-mutilation script for 6 of the 7 VAS measures: relaxed/tense, F (3, 126) = 15.82, $p < .0001$; relaxed/anxious, F (3, 126) = 16.57, $p < .0001$; calm/angry, F (3, 126) = 12.61, $p < .0001$; happy/sad, F (3, 42) = 3.94, $p < .05$; normal/unreal, F (3, 42) = 10.67, $p < .0001$; and relieved/uptight, F (3, 42) = 19.65, $p < .0001$. Unafraid/afraid was the exception. However, inspection of Figure 30 indicates that a reduction of negative feeling was evident following self-injury for this measure.

Reported negative feeling increased significantly from stage 1 to stage 2 for relaxed/tense (Fisher LSD = 10.40, $p < .05$); relaxed/anxious (Fisher LSD = 9.56, $p < .05$); calm/angry (Fisher LSD = 10.24, $p < .05$); and normal/unreal (Fisher LSD = 7.38, $p < .05$). Reported negative feeling was consistently high from stage 1 to stage

2 for happy/sad and relieved/uptight. Reported negative feeling remained at this high level from stage 2 to stage 3 for relaxed/tense, relaxed/anxious, calm/angry and happy/sad. Participants reported feeling significantly more unreal at stage 3 when self-cutting was imaged than at stage 2 (Fisher LSD = 7.38, $p < .05$). Participants reported feeling significantly more relieved at stage 3 than at stage 2 of the self-mutilation script (Fisher LSD = 9.53, $p < .05$). Participants reported feeling significantly more positive at stage 4 than at stage 3 for all VAS measures; relaxed/tense (Fisher LSD = 10.40, $p < .05$); relaxed/anxious (Fisher LSD = 9.56, $p < .05$); calm/angry (Fisher LSD = 10.24, $p < .05$); happy/sad (Fisher LSD = 7.40, $p < .05$); normal/unreal (Fisher LSD = 7.38, $p < .05$); and relieved/uptight (Fisher LSD = 9.53, $p < .05$).

In summary, for most VAS measures, negative feeling did not decrease significantly until stage 4. This result has indicated a lag between the between the reduction of psychophysiological arousal, at stage 3, and the reduction of negative feeling at stage 4, after imagery depicting the act of self-cutting was complete.

10.3.5 Current and recovered self-mutilation groups

Psychophysiological response to self-mutilation imagery

Group (current self-mutilation, recovered self-mutilation) x stage (scene, approach, incident, consequence) ANOVAs were conducted to investigate whether any differences in response to self-mutilation imagery existed between those participants who were

currently engaging in self-mutilative behaviour and those who had not self-mutilated for more than 6 months.

No significant differences between the current and recovered self-mutilation participants were demonstrated in response to self-mutilation imagery for any of the psychophysiological measures. In addition, further analyses demonstrated no significant differences between the current and recovered groups for any of the psychophysiological measures for accidental injury, anger or neutral scripts. Mean scores and standard deviations for current and recovered self-mutilation participants' psychophysiological responses for each stage of the four scripts are presented in Appendix R.

VAS response to self-mutilation imagery

Group (current self-mutilation, recovered self-mutilation) x stage (scene, approach, incident, consequence) ANOVAs were utilised to determine any significant differences in current and recovered self-mutilation participants' subjective response to self-mutilation imagery and to control imagery scripts. Mean scores and standard deviations for current and recovered self-mutilation participants' subjective responses for each of the four scripts are illustrated in Appendix R.

Significant group x stage interactions were evident for the self-mutilation script for 6 of the VAS measures: relaxed/tense, F (3, 126) = 4.42, $p < .001$; relaxed/anxious, F (3, 126) = 5.86, $p < .01$; calm/angry, F (3, 126) = 6.08, $p < .001$; unafraid/afraid, F (3, 126) = 4.74, $p < .01$;

happy/sad, F (3, 126) = 4.21, $p < .05$; and relieved/uptight, F (3, 126) = 4.53, $p < .01$. No significant difference between the groups was evident for the VAS measure normal/unreal. In addition, no significant differences between current and recovered self-mutilation participants were noted in terms of clarity of self-mutilation imagery or accuracy of self-mutilation script content.

Relaxed/tense. Figure 34 depicts the variation in response to the self-mutilation script between current and recovered self-mutilation for the VAS measure relaxed/tense.

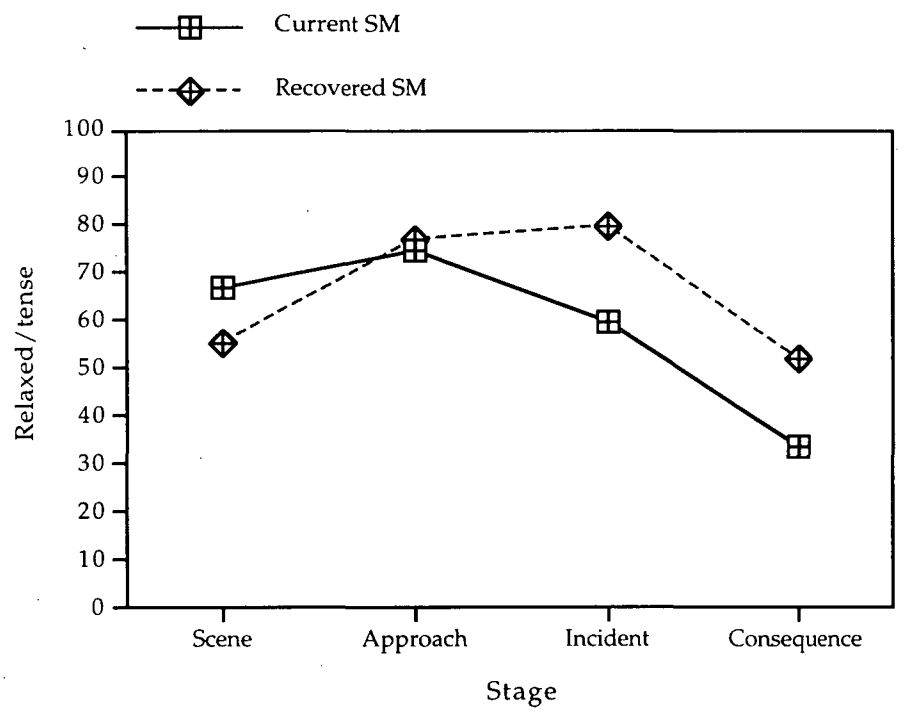


Figure 34. Variation in response to self-mutilation imagery between current and recovered self-mutilation groups for relaxed/tense.

No significant difference between current and recovered self-mutilation participants was evident at stage 1 or stage 2 of the self-mutilation script for relaxed/tense. However, the recovered group

reported feeling significantly more tense than the current group at stage 3, F (1, 42) = 7.41, $p < .01$, and stage 4, F (1, 42) = 4.06, $p < .05$.

A significant main effect for stage was evident for the current group for the self-mutilation script, F (3, 19) = 8.72, $p < .0001$. Inspection of Figure 34 indicates that feelings of tension decreased substantially at stage 3 for the current group. Current self-mutilation participants reported feeling significantly more relaxed at stage 4 than at stage 3, stage 2 and stage 1 (Fisher LSD = 17.01, $p < .05$).

A significant main effect for stage also was evident for the recovered group for the self-mutilation script, F (3, 23) = 11.52, $p < .0001$. Recovered self-mutilation participants reported feeling significantly more tense at stage 2 than at stage 1 of the self-mutilation script (Fisher LSD = 11.98, $p < .05$) and significantly more tense at stage 3 than stage 1 (Fisher LSD = 11.98, $p < .05$). Recovered self-mutilation participants reported consistently high feelings of tension from stage 2 to stage 3. This group reported feeling significantly less tense at stage 4 than at stage 3 and stage 2 of the self-mutilation script (Fisher LSD = 11.98, $p < .05$).

Relaxed/Anxious. Figure 35 illustrates the difference between current and recovered self-mutilation participants' VAS response to self-mutilation imagery.

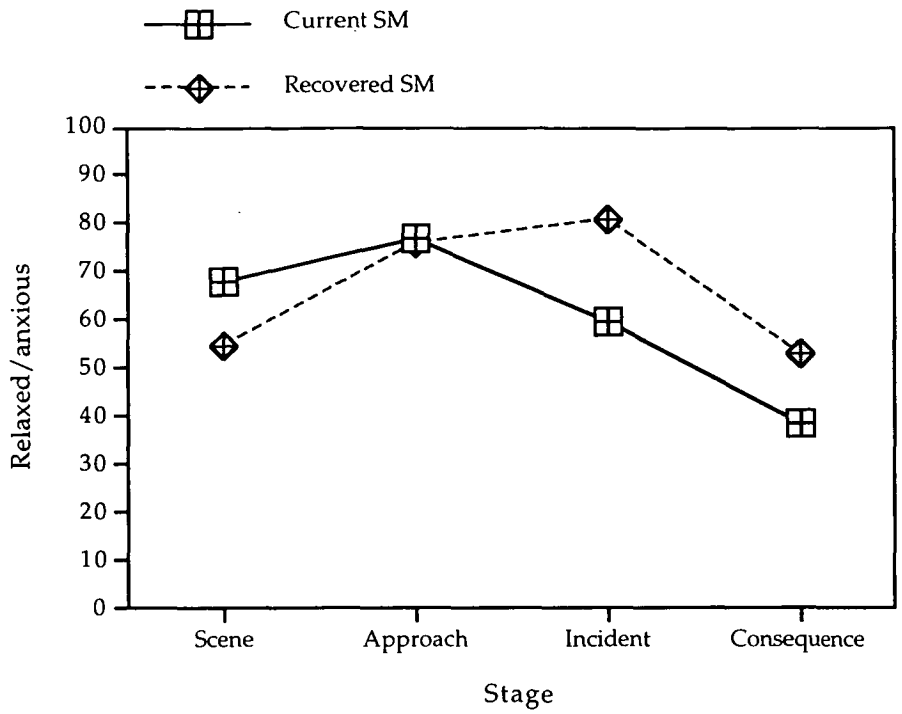


Figure 35. Variation in response to self-mutilation imagery between current and recovered self-mutilation groups for relaxed/anxious.

The level of anxiety reported at stages 1 and 2 of the self-mutilation script were comparable for the current and recovered groups. At stage 3, recovered self-mutilation participants reported feeling significantly more anxious than the current group, F (1, 42) = 9.17, $p < .01$. No significant difference between the groups was evident at stage 4.

A significant main effect for stage was evident for the current group for the self-mutilation script, F (3, 19) = 8.78, $p < .0001$. A high level of anxiety was reported at stage 1 and stage 2. Participants reported a significant reduction in anxious feelings from stage 2 to stage 3 when actual self-mutilation was imaged (Fisher LSD = 15.70, $p < .05$). Reported feelings of anxiety continued to decrease

significantly from stage 3 to stage 4 as the consequences of self-mutilation were depicted (Fisher LSD = 15.70, $p < .05$). In addition, participants reported feeling significantly more relaxed at stage 4 than at stage 1 or stage 2 (Fisher LSD = 15.70, $p < .05$).

A significant main effect for stage also was evident for the recovered self-mutilation group for the self-mutilation script, F (3, 23) = 14.65, $p < .0001$. These participants reported feeling significantly more anxious at stage 2 than at stage 1 (Fisher LSD = 10.56, $p < .05$) and significantly more anxious at stage 3 than at stage 1 of the self-mutilation script (Fisher LSD = 10.56, $p < .05$). Reported feelings of anxiety did not decrease until stage 4. At stage 4, recovered self-mutilation participants reported feeling significantly more relaxed than at stage 3 or stage 2 (Fisher LSD = 10.56, $p < .05$).

Calm/Angry. A comparison of subjective response across the four stages of the self-mutilation script for current and recovered self-mutilation participants for the VAS measure calm/angry is presented in Figure 36.

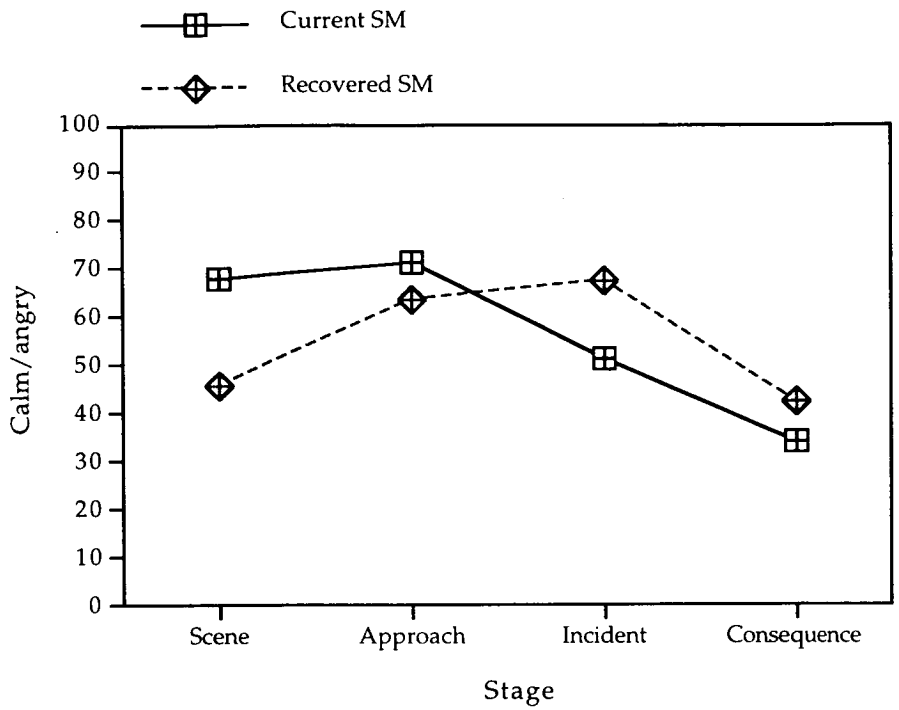


Figure 36. Variation in response to self-mutilation imagery between current and recovered self-mutilation groups for calm/angry.

At stage 1 of the self-mutilation script, the current group reported feeling significantly more angry than the recovered group, F (1, 42) = 5.88, $p < .05$). No significant difference between the groups was evident at stage 2. A trend towards the current group reporting feeling significantly calmer than the recovered group at stage 3 was noted, F (1, 42) = 3.24, $p < .08$. No significant difference in the level of negative feeling reported was noted at stage 4 for calm/angry.

A significant main effect for stage was demonstrated for the self-mutilation script for the current group, F (3, 19) = 9.05, $p < .05$. Reported feelings of anger remained constant from stage 1 to stage 2. Current self-mutilation participants reported feeling significantly calmer at stage 3 than at stage 2 and stage 1 (Fisher LSD = 16.19, $p <$

.05). Feelings of anger continued to decrease significantly from stage 3 to stage 4 (Fisher LSD = 16.19, $p < .05$). In addition, participants reported feeling significantly calmer at stage 4 than at stage 2 and stage 1 (Fisher LSD = 16.19, $p < .05$).

A significant main effect for stage also was indicated for the recovered group for the self-mutilation script, F (3, 23) = 8.56, $p< .05$. In contrast to the current group, the recovered group reported feeling significantly more angry at stage 2 than at stage 1 (Fisher LSD = 11.85, $p < .05$) and significantly more angry at stage 3 than at stage 1 (Fisher LSD = 11.85, $p < .05$). Recovered participants reported a significant reduction in angry feelings from stage 3 to stage 4 (Fisher LSD = 11.85, $p < .05$). In addition, recovered participants reported feeling significantly calmer at stage 4 than at stage 2 of the self-mutilation script (Fisher LSD = 11.85, $p < .05$).

Unafraid/Afraid. Figure 37 illustrates the difference between the current and recovered groups' psychological response to self-mutilation imagery for the VAS measure unafraid/afraid.

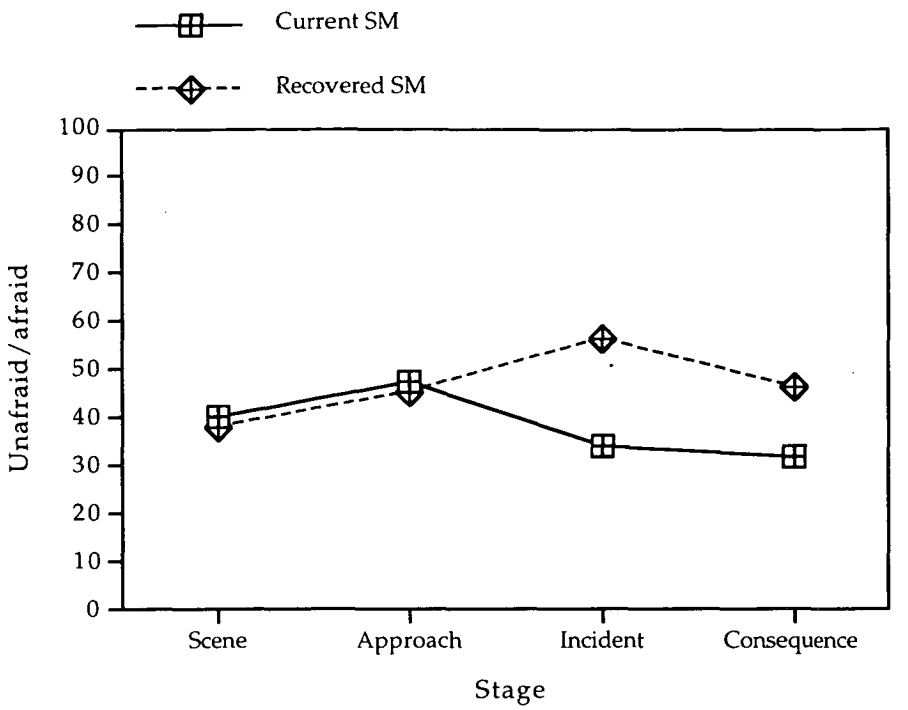


Figure 37. Variation in response to self-mutilation imagery between current and recovered self-mutilation groups for unafraid/afraid.

No significant difference between the groups' level of reported fear was evident at stage 1 and 2 of the self-mutilation script. At stage 3, the recovered group reported feeling significantly more afraid than the current group, F (1, 42) = 5.59, $p < .05$. No significant difference between the groups was noted at stage 4 for unafraid/afraid.

Current self-mutilation participants reported feeling relatively unafraid across the four stages of the self-mutilation script. No significant main effect for stage was evident. In contrast, a significant main effect for stage was demonstrated for the recovered group, F (3, 23) = 5.12, $p < .01$. Recovered participants reported feeling significantly more afraid at stage 3 than at stage 1 (Fisher LSD = 9.48, $p < .05$) and significantly more afraid at stage 3 than stage 2 of the self-

mutilation script (Fisher LSD = 9.48, $p < .05$). Reported feelings of fear decreased significantly from stage 3 to stage 4 for the recovered self-mutilation group (Fisher LSD = 9.48, $p < .05$).

Happy/sad. Figure 38 depicts the difference between the current and recovered groups' VAS response to self-mutilation imagery for happy/sad.

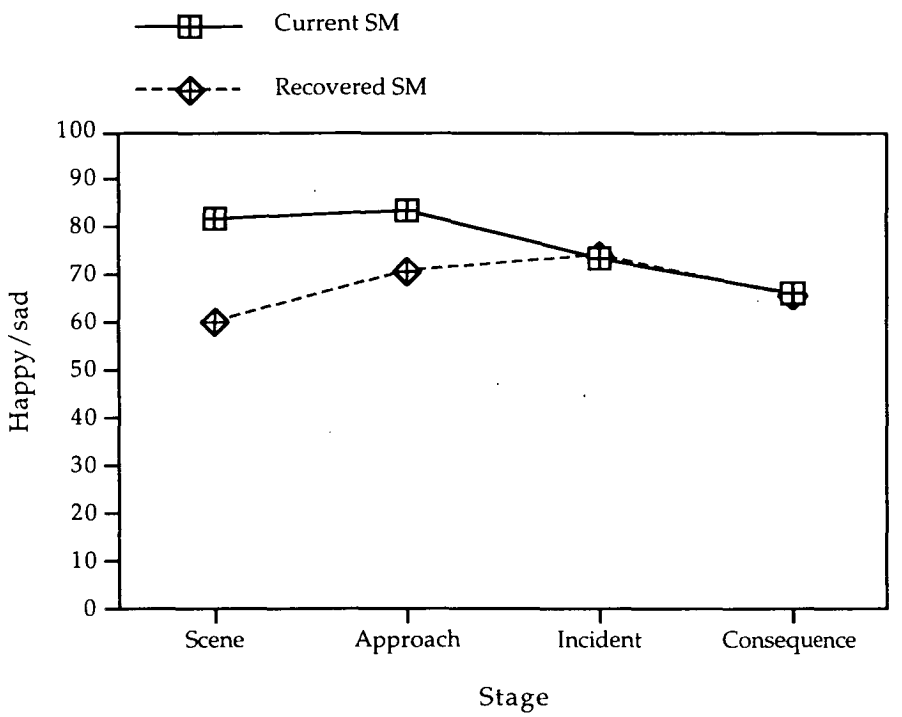


Figure 38. Variation in response to self-mutilation imagery between current and recovered self-mutilation groups for happy/sad.

Current self-mutilation participants reported feeling significantly sadder at stage 1 of the self-mutilation script than the recovered group, F (1, 42) = 7.95, $p < .01$. No other significant between group differences were evident for the self-mutilation script for happy/sad.

A main effect for stage was demonstrated for the current group for the self-mutilation script, F (3, 19) = 3.94, $p < .05$. The current group reported relatively high feelings of sadness across the first 3 stages of self-mutilation imagery. At stage 4, participants reported feeling significantly happier than at stage 2 (Fisher LSD = 11.44, $p <$ .05) and significantly happier at stage 1 than at stage 4 of the self-mutilation script (Fisher LSD = 11.44, $p < .05$).

The recovered group also demonstrated a significant main effect for stage for the self-mutilation script, F (3, 23) = 3.38, $p < .05$. In contrast to the current group, the recovered group reported feeling significantly sadder at stage 2 than at stage 1 (Fisher LSD = 9.15, $p <$ .05) and significantly sadder at stage 3 than at stage 1 of the self-mutilation script (Fisher LSD = 9.15, $p < .05$). No other significant between stage differences were noted.

Relieved/uptight. Figure 39 illustrates the difference between the current and recovered self-mutilation groups' response to self-mutation imagery for the VAS measure relieved/uptight.

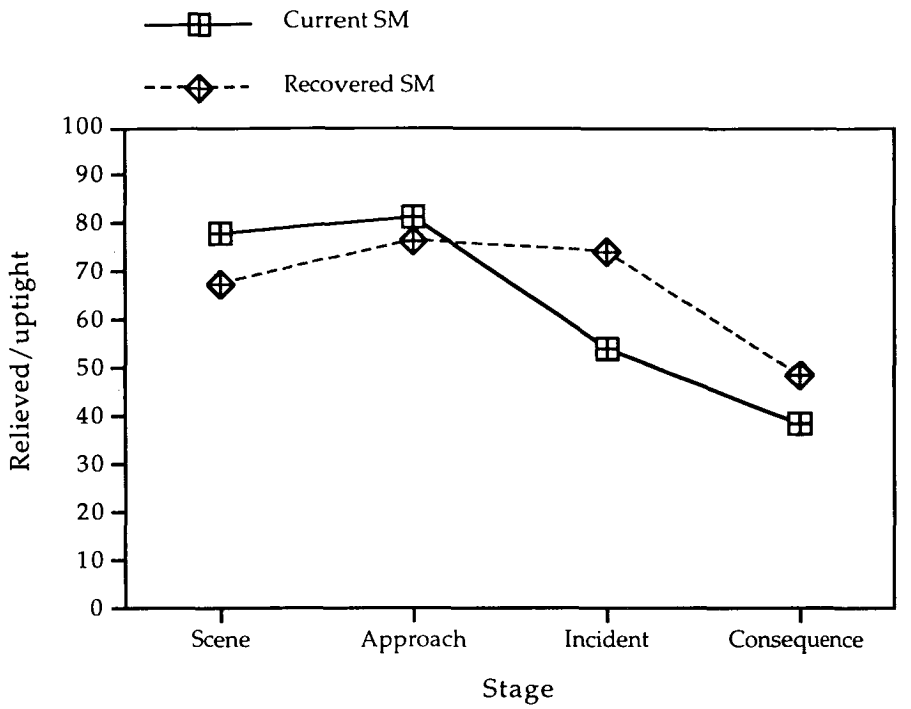


Figure 39. Variation in response to self-mutilation imagery between current and recovered self-mutilation groups for relieved/uptight.

No significant difference between current and recovered groups' level of reported unpleasant feeling was evident at stage 1 or stage 2 for relieved/uptight. However, at stage 3 the current group reported feeling significantly more relieved than the recovered group, F (1, 42) = 6.73, $p < .05$. No significant difference between the groups was noted at stage 4.

A significant main effect for stage was evident for the self-mutilation script for the current group, F (3, 19) = 19.22, $p< .0001$. Current participants reported feeling consistently uptight from stage 1 to stage 2 of self-mutilation imagery. Participants reported feeling significantly more relieved at stage 3, as actual self-mutilation was imaged than at stage 2 and stage 1 (Fisher LSD = 13.14, $p < .05$). Low

levels of negative feeling continued from stage 3 to stage 4. At stage 4, current participants reported feeling significantly more relieved than at stage 2 and stage 1 (Fisher LSD = 13.14, $p < .05$).

A significant main effect for stage for the self-mutilation script also was demonstrated for the recovered group, $F(3, 23) = 7.69$, $p < .001$. Recovered participants reported feeling relatively uptight across the first 3 stages of imagery. Recovered participants did not report feeling relieved until stage 4. At stage 4, recovered participants reported feeling significantly more relieved than at stage 2 and stage 1 (Fisher LSD = 12.94, $p< .05$).

Only one significant difference between current and recovered self-mutilation groups was noted for the control scripts. A significant group x stage interaction was evident for the anger script for the VAS measure; relieved/uptight, F (3, 120) = 3.72, $p < .05$. Post hoc analyses demonstrated that the recovered group reported feeling significantly more uptight than the current group at stage 4 of the anger script, F (1, 40) = 4.35, $p < .05$.

In summary, significant differences between current and recovered self-mutilation participants' VAS responses to self-mutilation imagery have been demonstrated. Most importantly, current self-mutilation participants have reported significantly lower levels of negative feeling at stage 3 of the self-mutilation script than the recovered group for 4 of the VAS measures. Differences between the current and recovered groups' subjective responses to control imagery were negligible.

10.3.6. Sex differences in response to self-mutilation imagery

There were no significant differences between male and female self-mutilation participants in response to self-mutilation imagery for any of the psychophysiological or VAS measures. In addition, no significant differences between males and females were evident in terms of psychophysiological and VAS response to control imagery. Mean scores and standard deviations for each stage of the self-mutilation script for males and females for psychophysiological and VAS measures are presented in Appendix S.

10.3.7 Frequent and infrequent self-mutilation groups

Psychophysiological response to self-mutilation imagery

There were no significant differences between frequent and infrequent self-mutilation groups' responses to the self-mutilation script for any of the four psychophysiological measures. In addition, no significant between group differences for control imagery scripts were noted. Mean scores and standard deviations for each of these measures in response to imagery for frequent and infrequent self-mutilation participants are presented in Appendix T.

VAS response to self-mutilation imagery

Between group differences were demonstrated for the self-mutilation script for 4 of the VAS measures; relaxed/anxious, F (3, 123) = 3.42, $p < .05$; unafraid/afraid, F (3, 123) = 4.78, $p < .01$; happy/sad, F (3, 123) = 4.15; $p < .05$; and relieved/uptight, F (3, 123) =

3.72, $p < .05$. Mean scores and standard deviations for frequent and infrequent self-mutilation participants for each stage of the self-mutilation and control scripts are presented in Appendix T.

Relaxed/anxious. Figure 40 depicts the variation in response for the frequent and infrequent participants for the self-mutilation script for the VAS relaxed/anxious.

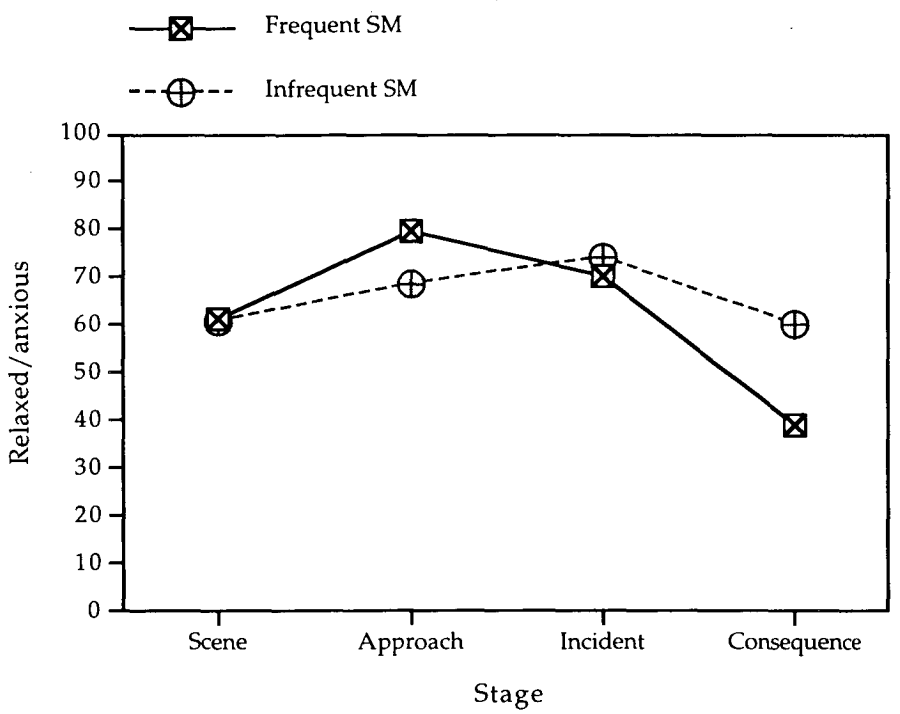


Figure 40. Variation in response to self-mutilation imagery between frequent and infrequent self-mutilation participants for relaxed/anxious.

Further analyses demonstrated that infrequent self-mutilation participants reported feeling significantly more anxious than the frequent group at stage 4 of the self-mutilation script, F (1, 41) = 4.66, $p < .05$.

A significant main effect for stage was evident for the frequent group in response to the self-mutilation script, F (3, 84) = 14.94, $p <$

.0001. Participants reported feeling significantly more anxious at stage 2 than at stage 1 (Fisher LSD = 12.56, $p < .05$) of this script. In addition, significantly lower levels of anxiety were reported at stage 4 than at stages 1, 2, and 3 (Fisher LSD = 12.56, $p < .05$). In contrast, no significant variation in reported levels of anxiety across the four stages of the self-mutilation script were evident for the infrequent self-mutilation group.

Unafraid/afraid. A significant group x stage interaction was evident for the self-mutilation script for unafraid/afraid, F (3, 123) = 4.78, $p < .01$. This variation in response for frequent and infrequent participants is illustrated in Figure 41.

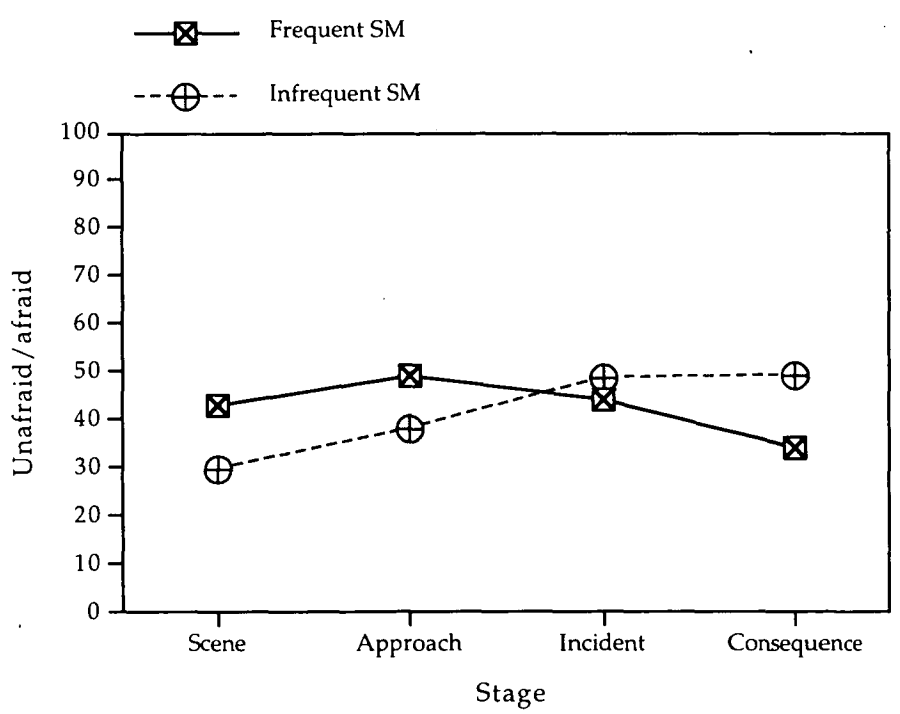


Figure 41. Variation in response to self-mutilation imagery between frequent and infrequent self-mutilation participants for unafraid/afraid.

Further analyses did not demonstrate specific differences between frequent and infrequent self-mutilation participants at each stage of the self-mutilation script for unafraid/afraid. However, as inspection of Figure 41 illustrates, the pattern of fear reported across the four stages of the self-mutilation script for the two groups was quite different. A significant main effect for stage was demonstrated for the frequent group, F (3, 84) = 3.00, $p < .05$. This group reported a significant reduction in fear from stage 2 to stage 4 (Fisher LSD = 9.98, $p < .05$). A significant main effect for stage also was demonstrated for the infrequent group for the self-mutilation script, F (3, 39) = 3.70, $p <$ .05. However, infrequent self-mutilation participants reported feeling significantly more fearful at stage 3 and stage 4 than at stage 1 of the self-mutilation script (Fisher LSD = 14.00, $p < .05$).

Happy/sad. A significant difference between frequent and infrequent self-mutilation groups was demonstrated in response to the self-mutilation script for the VAS measure happy/sad. Figure 42 illustrates this variation.

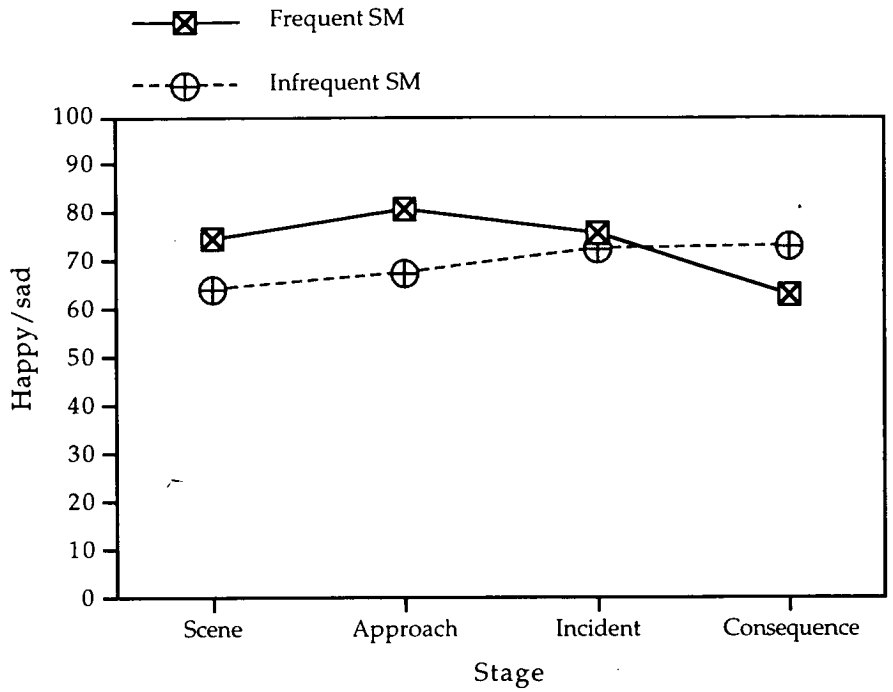


Figure 42. Variation in response to self-mutilation imagery between frequent and infrequent self-mutilation participants for happy/sad.

Again, no specific differences between frequent and infrequent self-mutilation participants were demonstrated at each stage of the self-mutilation script for happy/sad. However, the pattern of response across the four stages of the self-mutilation script for the two groups differed. A significant main effect for stage was demonstrated for the frequent group, F (3, 84) = 6.15, $p < .01$. Participants reported feeling significantly happier at stage 4 than at stages 1, 2, and 3 of the self-mutilation script (Fisher LSD = 8.96, $p <$ .05). In contrast, no significant variation in reported feelings of sadness were evident across the four stages of the self-mutilation script for the infrequent group.

Relieved/uptight. Figure 43 depicts the significant variation between frequent and infrequent self-mutilation participants in

response to the self-mutilation script for the VAS measure relieved/uptight, F (3, 123) = 3.72, $p < .05$.

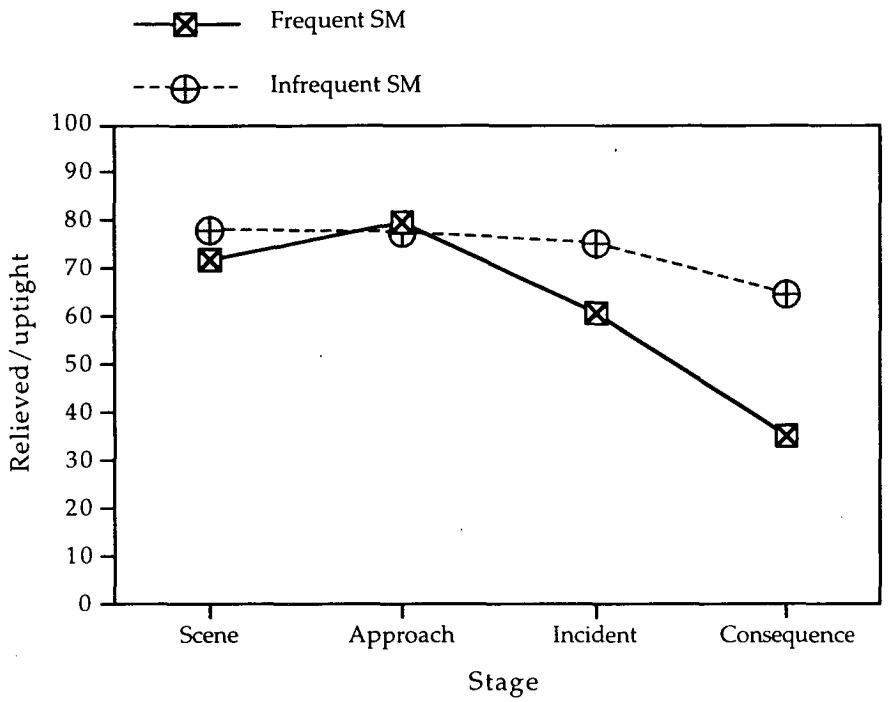


Figure 43. Variation in response to self-mutilation imagery between frequent and infrequent self-mutilation participants for relieved/uptight.

Further analyses demonstrated that the frequent group reported feeling significantly more relieved than the infrequent self-mutilation participants at stage 4 of the self-mutilation script, F (1, 41) = 13.61, $p < .001$.

A significant main effect was demonstrated for stage for the frequent group for the self-mutilation script, F (3, 84) = 20.08, $p < .0001$. Frequent self-mutilation participants reported feeling significantly more uptight at stage 1 than at stage 4 of the self-mutilation script (Fisher LSD = 12.28, $p < .05$). A significant reduction in negative feelings was evident from stage 2 to stage 3,

and from stage 3 to stage 4 (Fisher LSD = 12.28, $p < .05$). In addition, participants reported feeling significantly more relieved at stage 4 than at stage 2 (Fisher LSD = 12.28, $p < .05$). No significant variation across the four stages of the self-mutilation script was demonstrated for the infrequent self-mutilation group for the VAS measure relieved/uptight.

In summary, a variation in response to self-mutilation imagery between frequent and infrequent self-mutilation participants has been demonstrated for some VAS measures. No significant differences between frequent and infrequent self-mutilation participants were elicited in response to control imagery scripts for these measures. In addition, no significant differences in clarity or accuracy of imagery information between frequent and infrequent groups were evident.

10.4 DISCUSSION

10.4.1 Tension reduction model

The tension reduction model of self-mutilation previously has been verified using a prisoner sample of male self-mutilation participants (Haines, Williams, Brain et al., 1995). The present study has demonstrated that these results are generalisable to a broader population of individuals who self-mutilate. In addition, no significant differences between the psychophysiological and psychological responses of male and female participants to self-mutilation imagery were evident. Results indicated that the act of

self-mutilation effectively provides a reduction in psychophysiological arousal and an improvement in psychological state.

Initial analyses demonstrated a lag between the reduction of psychophysiological arousal and psychological distress in response to self-mutilation imagery. This result has replicated the findings of previous research (Haines, Williams, Brain et al., 1995). In the present study, a significant decrease in psychological distress was not evident until the consequence stage for most VAS measures, after imagery depicting the act of self-mutilation was complete. A significant increase in feelings of depersonalisation as assessed by the VAS measure normal/unreal was reported during stage 3, when the act of self-mutilation was described. This depersonalisation experience was reported to decrease significantly following the self-mutilative act.

In contrast, participants reported a significant reduction in uptight feeling at the incident stage, and from the incident to the consequence stage. The VAS measure relieved/uptight represented a subjective interpretation of psychophysiological arousal. Other VAS measures were more representative of psychological or emotional reactions. The lack of convergence of responses for VAS measures to self-mutilation imagery has demonstrated the complex range of psychological reactions associated with the act of self-mutilation.

As mentioned, the control group was included in the present study to determine whether individuals who self-mutilate respond aberrantly to imagery depicting everyday events. Psychophysiological results from the initial analyses have demonstrated that individuals who self-mutilate respond appropriately to angry interactions, accidental injury and neutral events.

VAS results indicated that self-mutilation participants experienced more extreme subjective reactions to anger and neutral imagery scripts than the control group. Self-mutilation participants reported higher levels of negative feeling than control participants in response to anger imagery. In response to the neutral script, self-mutilation participants reported feeling significantly more positive than the control group, whose response to neutral imagery could best be described as neutral (i.e., neither negative or positive). Individuals who engage in self-mutilation have been described as emotionally labile (Simpson, 1976; Zweig-Frank et al., 1994a). As detailed in the second study, self-mutilation participants scored higher on a measure of empathy than the control group, indicating that they had a heightened sensitivity to the perceived emotional experiences of others. The extreme subjective ratings demonstrated in the present study may be a result of this lability.

As anticipated, the pattern of psychophysiological and psychological response to the self-mutilation and control imagery scripts was quite different. The arousal reduction pattern that was

demonstrated in response to self-mutilation imagery was unique to injury that was self-inflicted. Self-mutilation participants responded appropriately to control imagery scripts and elicited a significant increase in psychophysiological arousal and unpleasant feelings in response to imagery depicting accidental injury. In contrast, a significant reduction in psychophysiological arousal was evident for the self-mutilation script, during the incident stage, when actual self-injury was imaged. For some psychophysiological measures, arousal was as low for the self-mutilation script at stage 3 as for the corresponding stage of the neutral script.

10.4.2 Current and recovered self-mutilation participants

Initial results of the current investigation have replicated the lag between the reduction in psychophysiological arousal and psychological distress that previously has been demonstrated (Haines, Williams, Brain et al., 1995). These results have supported the proposition that it is the immediate reduction in psychophysiological arousal that serves to reinforce self-mutilative behaviour rather than the individual's emotional response to the act.

Comparisons between the responses of self-mutilation participants who were currently engaging in the behaviour and a retrospective self-mutilation sample were conducted initially to determine the efficacy of a guided imagery methodology in charting the processes of a behaviour in which a person is no longer engaging.

These results have clarified further the reinforcement qualities of self-mutilation.

Results indicated that for individuals who were currently engaging in the behaviour, the act of self-mutilation is immediately psychophysiologically and psychologically reinforcing. A significant decrease in arousal was evident at the incident stage of the self-mutilation script for 3 of the 4 psychophysiological measures. In addition, a significant reduction in psychological distress was evident for 3 of the 7 VAS measures when actual self-cutting was imaged. A substantial reduction in psychological distress was demonstrated from stage 2 to stage 3 for other VAS measures. For those who were currently engaging in the behaviour, an appropriate cognitive interpretation of the alteration in psychophysiological state that is induced by self-mutilation was evident.

A lag between the reduction in psychophysiological arousal and negative feeling was evident only for the recovered self-mutilation group. At stage 3, the recovered sample reported significantly higher levels of psychological distress than the current group for 4 of the VAS measures. Recovered self-mutilation participants interpreted the actual act of self-mutilation as stressful and emotionally distressing even though psychophysiological arousal decreased significantly during imagery depicting the self-injurious act.

Most people who have never engaged in the behaviour would consider self-mutilation to be an aberrant and anxiety provoking act.

Results of the present study would indicate that the act of self-injury is cognitively reinterpreted when self-mutilation is no longer part of an individual's behavioural repertoire. However, it is clear that the psychophysiological reinforcement properties of the act remain the same. It may be that people are more aware of issues such as the social desirability of self-mutilation when they are no longer engaging in the behaviour. Indeed, this reinterpretation may protect the individual to some extent from re-engaging in the behaviour following a prolonged period of abstinence. The factors that contribute to the reinterpretation of the psychological response to self-mutilation require further investigation.

10.4.3 Repetitive self-mutilation

It is clear that individuals engage in self-mutilative behaviour because of the tension reducing qualities that the act itself provides (Brain et al., in press, 1998; Favazza & Rosenthal, 1993; Haines, Williams, Brain et al., 1995). Results of the present investigation have illustrated the immediate psychophysiological and psychological reinforcement qualities of the act itself. It makes sense to consider that self-mutilation is a behaviour that is prone to becoming habitual due to these reinforcing elements.

It was expected that frequent self-mutilation participants would evidence a significantly stronger pattern of psychophysiological arousal reduction and psychological reward associated with the act of self-mutilation. The results were

unexpected. No significant differences between frequent and infrequent participants in response to self-mutilation imagery were evident for any of the psychophysiological measures. This result has demonstrated that the self-mutilative act is as psychophysiologically reinforcing for individuals who only have engaged in a few episodes as it is for those who use the behaviour on a habitual basis.

Comparison of the VAS responses to self-mutilation imagery between frequent and infrequent groups were of particular interest. No between group differences were evident in response to control imagery. Significant between group differences were evident for 4 of the 7 VAS measures for self-mutilation imagery. For relaxed/anxious, unafraid/afraid, happy/sad, and relieved/uptight a distinct pattern of reduction in unpleasant feeling was demonstrated in response to self-mutilation. Significant reductions in anxiety, fear and sadness was noted following self-mutilation. Frequent self-mutilation participants reported feeling significantly more relieved on commission of the act. These feelings of relief continued throughout the consequence stage of imagery.

The pattern of psychological response to imagery reported by infrequent self-mutilation participants for these measures was quite different. No significant alteration in degree of anxiety, sadness or uptight feeling was evident during the self-mutilation script. For unafraid/afraid, feelings of fear increased significantly during and following the self-mutilative act.

These results have indicated that self-mutilation initially is perceived as a frightening experience which is associated with limited psychological benefits. However, the immediate reduction in psychophysiological arousal that the act provides serves to increase the likelihood of the behaviour occurring again. Results have suggested that repetition of self-mutilation decreases the fear associated with the behaviour and that psychological benefits of the act develop as the behaviour becomes habitual.

10.4.4 Summary and conclusions

Results of the present study have provided support for the notion that the self-mutilative act is so immediately psychophysiologically reinforcing that it may be difficult to resist the impulse to self-mutilate when a distressing emotional state is experienced (Bennum, 1983; Favazza & Simeon, 1995; Haines, Williams, Brain et al., 1995; Simeon et al., 1992). Therefore, it is unlikely that individuals cease engaging in the behaviour because the self-mutilation fails to provide the desired relief from psychophysiological and emotional tension. Previous research has suggested that it is the immediate reduction in psychophysiological arousal that the act provides that serves to reinforce the behaviour (Haines, Williams, Brain et al., 1995). Results of the present study have supported this notion.

Results have indicated that the reduction in psychophysiological arousal is of primary importance in the

reinforcement of the behaviour. However, it is clear that other factors also are important in the development of a repetitive behavioural cycle. Results have demonstrated that the psychological response to the act of self-mutilation is reinterpreted when the individual is no longer engaging in the behaviour and that the interpretation of the psychological benefits that the act provides alter as the behaviour becomes habitual. Investigation of the cognitive processes associated with self-mutilative behaviour may clarify the role of psychological and cognitive factors in the performance of self-mutilation. The following chapter addresses this issue.

CHAPTER 11

STUDY 5: COGNITIVE REHEARSAL OF SELF-MUTILATION

11.1 INTRODUCTION

Results of the fourth study in this investigation have demonstrated that the act of self-mutilation is subject to both psychological and psychophysiological reinforcement. However, the lack of difference between frequent and infrequent self-mutilation groups in the strength of the reinforcement that the act provides indicates that this process alone cannot account for the development of a repetitive pattern of self-mutilation. In order to manage self-mutilative behaviour effectively and prevent the behaviour from becoming a habitual response, it is important to identify all of the processes that contribute to the development and maintenance of the behaviour.

Researchers have emphasised the role of covert processes in behaviour acquisition (Cautela, 1976, 1977; Cautela & Baron, 1973; Driskell et al., 1994; Huesmann & Eron, 1984; Lennings, 1994). Indeed, the repetitive process of imagining successfully completing a task has been utilised to build appropriate behaviour into an individuals' behavioural repertoire (Cautela, 1976; Driskell et al., 1994; Lennings, 1994).

A meta-analysis of the literature regarding mental practice was conducted to determine the effect of cognitive rehearsal on task performance (Driskell et al., 1994). These researchers also aimed to identify the conditions under which cognitive rehearsal is most effective. Results demonstrated that cognitive rehearsal does have a significant and positive impact on the performance of overt

behavioural tasks. In addition, results indicated that the effectiveness of cognitive rehearsal is moderated by the type of task, the time interval between the cognitive rehearsal and task performance, and the duration of the cognitive rehearsal. Mental practice optimally effected the performance of tasks with some cognitive elements, when the duration of time between cognitive rehearsal and actual task performance was relatively short, and when the duration of the rehearsal itself was restricted (Driskell et al., 1994).

The importance of covert processes in the acquisition of maladaptive behaviour has been recognised (Cautela & Baron, 1977; Lennings, 1994). In fact, the underlying assumption of cognitive therapy is that maladaptive ideation causes and maintains maladaptive behaviour (Lennings, 1994). In addition, it has been proposed that nondirected covert conditioning contributes substantially to the development and intensification of maladaptive behaviour (Binder, 1975).

The role of cognitive rehearsal in the development of suicidal behaviour has been recognised (Lennings, 1994). Research has indicated that suicidal individuals prepare to die through the use of imagination (Litman, 1990). It has been suggested that suicidal individuals may have a recurrent fantasy regarding how they will die, and, with repetition, this fantasy develops into a plan for suicide that eventually will be carried out (Houston, 1987).

The role of cognitive processes in the development and maintenance of self-mutilation has not yet been considered.

However, the value of covert procedures for the management of self-mutilative behaviour has been recognised (Cautela & Baron, 1973). Covert sensitisation was included in a treatment package developed to address self-burning in a single case (Cox & Klinge, 1976). Unfortunately, the design of the study prevented the evaluation of the efficacy of the individual components of the treatment programme. Covert sensitisation has been identified as an effective strategy for the management of severe nail biting (Daniels, 1974; Paquin, 1977). In addition, in a single case study, repetitive wrist cutting behaviour was eliminated using covert sensitisation (Jurgela, 1993).

Covert treatment procedures are based on a number of assumptions. It has been suggested that overt and covert behaviours are influenced by the same parameters (homogeneity assumption), that they interact with each other according to these parameters (interaction assumption), and that they respond similarly to the laws of learning (learning assumption) (Cautela & Kearney, 1986).

According to these assumptions, the more frequently an individual cognitively rehearses the act of self-mutilation the more often the behaviour is likely actually to be carried out, and the better established it becomes as part of the individual's behavioural repertoire. The psychophysiological and psychological reinforcement that the act itself provides serves to strengthen both the overt and covert responses, ensuring that the individual will continue to both think about, and engage in, self-mutilation.

In addition, research has demonstrated that imaged events can lead to the same psychophysiological effects as the overt behaviour (Brain et al., 1996; Cook et al., 1988; Lang, 1979, Lang et al., 1980; Haines, Williams, Brain et al., 1995; Pitman et al., 1987; Watkins et al., 1990). A significant alteration in psychophysiological arousal has been elicited using guided imagery of self-mutilative behaviour (Brain et al., in press, 1998; Haines, Williams, Brain et al., 1995). Therefore, if individuals do engage in cognitive rehearsal of self-mutilation, it is likely that some degree of arousal reduction may occur in conjunction with that rehearsal, serving to reinforce both covert and overt processes associated with the behaviour.

In order to effectively manage self-mutilative behaviour it is important to treat all of the processes associated with the maintenance of the behaviour. The aim of the present study was to determine whether individuals who self-mutilate engage in cognitive rehearsal of the behaviour and to investigate the nature and effect of this rehearsal if it occurs.

It was suggested that if cognitive rehearsal is associated with the maintenance of self-mutilation, individuals who were currently engaging in the behaviour would report a higher degree of cognitive rehearsal of self-mutilation than those who were no longer engaging in the behaviour.

It was of interest to examine any differences in cognitive processes associated with self-mutilation between male and female participants to determine whether covert treatment programmes

would need to be tailored differently so as to be effective for both males and females who engage in the behaviour. A review of the literature has indicated a distinct lack of research regarding sex differences in cognitive rehearsal or imagery ability. As mentioned previously, research has demonstrated that females are significantly more introspective than males (Ingram et al., 1988). Therefore, it was hypothesised that females would report a higher rate of cognitive rehearsal than males.

It also was of interest to investigate the role of cognitive rehearsal in the development of a repetitive behavioural pattern of self-mutilative behaviour. It was hypothesised that individuals who reported frequently engaging in self-mutilative behaviour would report a higher rate of cognitive rehearsal than infrequent self-mutilation participants.

11.2 METHOD

11.2.1 Participants

A sample of thirty-five of the original 46 self-mutilation participants completed this study. Some participants were unable to complete this final study due to other commitments.

11.2.2 Materials

A Cognitive Rehearsal of Self-mutilation Scale (CROSS) was developed by the author for the purpose of assessing the presence, nature and extent of cognitive rehearsal of self-mutilative behaviour.

This 69 item scale consisted of 7 sections that assessed the following components; (a) Presence of Cognitive Rehearsal; (b) Covert Conditioning; (c) Covert Reinforcement; (d) Circumstances of Cognitive Rehearsal; (e) Quality of Cognitive Rehearsal; (f) Intrusive Thoughts; and (g) Control Over Thoughts and Actions.

The Presence of Cognitive Rehearsal section consisted of a rating of the frequency of cognitive rehearsal (e.g., I have recently pictured or thought about injuring myself). Covert Conditioning considered the association between cognitive rehearsal and the performance of the behaviour (e.g., the more I think about injuring myself the more I seem to end up doing it). The Covert Reinforcement section assessed the reinforcement processes or consequences of cognitive rehearsal of self-mutilation (e.g., I feel better when I think about harming myself).

The Circumstances section was developed in order to investigate the situations which promoted cognitive rehearsal of self-mutilation. Items for this section were based on the Motivation for Self-mutilation Scale. Items assessed motivations of Depression (e.g., I think about injuring myself when I am feeling sad), Alienation (e.g., thoughts about hurting myself seem to go round in my head when I am feeling lonely and isolated), Modelling (e.g., I think about the ways other people injure themselves), Avoidance (e.g., when I feel trapped in a situation I find that I think about hurting myself to get away), Tension Reduction (e.g., when I need to calm down I find myself thinking about hurting myself) and Janus Face (e.g., when I

think about hurting myself I feel uncertain as to whether I want to live or die). Extrapunitive (e.g., when I feel angry and upset with someone I find that I picture or think about harming myself to make them sorry), Intropunitive (e.g., thoughts or pictures about injuring myself pop into my head when I feel like I deserve to be punished), and Operant (e.g., when I think about hurting myself I picture how people will change when they find out what I have done) motivational subscales also were considered.

The Quality of Rehearsal section of the CROSS examined the detail of imagery and extent of rehearsal associated with self-mutilation (e.g., I find that images or thoughts about harming myself flash quickly through my mind). The Intrusive Thoughts section considered the severity of self-mutilation-related intrusive thoughts (e.g., thoughts about injuring myself just seem to go round and round inside my head and they won't go away). The final section assessed the degree of control that individuals reported having over their self-mutilative behaviour (e.g., I don't seem to have much control over injuring myself, it just seems to happen before I know it).

All items were scored on a 5 point scale; 1 = Never to 5 = Always. A copy of this scale is presented in Appendix U. Mean scores were calculated for each section and for each of the 9 subscales of the Circumstances section.

11.2.3 Procedure

The CROSS was administered verbally to participants as part of the initial interview regarding the nature and extent of self-mutilative behaviour.

11.3 RESULTS

11.3.1 Overview

Initially, descriptive statistics were utilised to determine the nature of cognitive rehearsal for the total sample of participants. In addition, a repeated measures ANOVA was used to determine any significant differences between the subscales of the Circumstances section of the CROSS.

Unpaired t-tests were utilised to determine any differences between current and recovered self-mutilation groups, male and female participants, and frequent and infrequent self-mutilation groups for each of the sections of the CROSS. The Presence of Cognitive Rehearsal section consisted of two items that assessed the frequency of current cognitive rehearsal, and whether or not individuals had engaged in cognitive rehearsal previously. A comparison of each of these items between current and recovered self-mutilation participants was conducted to determine whether frequency of cognitive rehearsal altered when an individual was no longer engaging in the behaviour.

11.3.2 Total sample

Mean scores and standard deviations for each section of the CROSS are presented in Table 39.

Table 39.
Mean scores and standard deviations for the total sample of self-mutilation participants for each section of the CROSS.

CROSS section	M	SD
Presence of Cognitive Rehearsal	2.74	(1.07)
Covert Conditioning	2.60	(1.00)
Covert Reinforcement	2.12	(0.88)
Circumstances		
Depression	2.28	(1.04)
Extrapunitive	1.47	(0.73)
Alienation	2.35	(1.27)
Operant	1.58	(0.78)
Modelling	1.51	(0.71)
Avoidance	1.94	(0.96)
Tension reduction	1.69	(0.96)
Janus face	2.30	(1.17)
Intropunitive	2.23	(1.22)
Quality of Cognitive Rehearsal	2.56	(0.61)
Intrusive Thoughts	2.05	(1.21)
Control Over Thoughts and Actions	3.29	(0.89)

There was a significant variation between the subscale scores of the Circumstances section of the CROSS for the total sample of participants, F (8, 314) = 8.41, $p < .0001$. Post hoc analyses demonstrated no significant differences between mean scores for the Alienation, Janus Face, Depression and Intropunitive subscales. Mean score for Alienation was significantly higher than for all other subscales (Fisher LSD = 0.35, $p < .05$). Mean scores for Janus Face, Depression and Intropunitive did not differ significantly from the

Avoidance subscale but were significantly higher than for all remaining subscales (Fisher LSD = 0.35, $p < .05$). No significant difference between the Avoidance and Tension Reduction subscales was noted. However, the mean score for Avoidance was significantly higher than for the Operant, Modelling and Extrapunitive subscales (Fisher LSD = 0.35, $p < .05$). Tension Reduction, Operant, Modelling and Extrapunitive items were least frequently endorsed. Mean scores for these subscales did not significantly differ from each other.

11.3.2 Current and recovered self-mutilation groups

Significant differences between current and recovered self-mutilation participants were demonstrated for two of the sections of the CROSS. For the Presence of Cognitive Rehearsal section, current self-mutilation participants reported presently thinking about self-mutilation significantly more often than the recovered group, t (33) = 2.19, $p < .05$. In addition, current self-mutilation participants scored significantly higher than the recovered group for Covert Conditioning, t (33) = 2.33, $p < .05$. Mean scores and standard deviations for current and recovered self-mutilation groups for the CROSS are presented in Table 40.

Table 40.
Mean scores and standard deviations for the current and recovered self-mutilation groups for each subscale of the CROSS.

CROSS section	Current SM		Recovered SM	
	M	SD	M	SD
Presence of Cognitive Rehearsal				
Current cognitive rehearsal	2.60	(1.30)	1.70	(1.13)*
Past cognitive rehearsal	3.27	(1.39)	3.40	(1.19)
Covert Conditioning	3.02	(1.06)	2.28	(0.83)*
Covert Reinforcement	2.33	(1.19)	1.95	(0.52)
Circumstances				
Depression	2.51	(1.00)	2.11	(1.06)
Extrapunitive	1.44	(0.64)	1.49	(0.81)
Alienation	2.63	(1.35)	2.14	(1.19)
Operant	1.69	(0.83)	1.49	(0.76)
Modelling	1.57	(0.66)	1.47	(0.77)
Avoidance	2.12	(1.00)	1.81	(0.94)
Tension reduction	1.89	(1.05)	1.54	(0.89)
Janus face	2.45	(1.26)	2.18	(1.11)
Intropunitive	2.48	(1.11)	2.04	(1.29)
Quality of Cognitive Rehearsal	2.63	(0.78)	2.51	(0.45)
Intrusive Thoughts	2.48	(1.31)	1.73	(1.05)
Control Over Thoughts and Actions	3.28	(0.99)	3.30	(0.83)

* $p < .05$.

11.3.4 Sex differences

A significant difference between male and female self-mutilation participants was demonstrated for the Quality of Cognitive Rehearsal section of the CROSS. Females reported a significantly higher quality of cognitive rehearsal of self-mutilation than male participants, t (33) = 2.05, $p < .05$. No other significant differences between males and females were noted. Mean scores and standard deviations for male and female self-mutilation participants for the CROSS are presented in Table 41.

Table 41.
Mean scores and standard deviations for male and female self-mutilation participants for each subscale of the CROSS.

CROSS section	Male SM		Female SM	
	M	SD	M	SD
Presence of Cognitive Rehearsal	2.56	(0.98)	2.89	(1.14)
Covert Conditioning	2.44	(0.58)	2.73	(1.25)
Covert Reinforcement	2.17	(1.16)	2.07	(0.57)
Circumstances				
Depression	2.34	(1.07)	2.23	(1.04)
Extrapunitive	1.51	(0.79)	1.43	(0.70)
Alienation	2.11	(1.12)	2.55	(1.38)
Operant	1.69	(0.93)	1.49	(0.64)
Modelling	1.52	(0.57)	1.51	(0.83)
Avoidance	1.79	(0.91)	2.07	(1.01)
Tension reduction	1.54	(0.67)	1.81	(1.16)
Janus face	2.27	(1.13)	2.32	(1.23)
Intropunitive	2.00	(1.05)	2.42	(1.34)
Quality of Cognitive Rehearsal	2.34	(0.55)	2.75	(0.60) *
Intrusive Thoughts	1.81	(0.97)	2.25	(1.38)
Control over Thoughts and Actions	3.37	(0.77)	3.22	(0.99)

* $p < .05$, ** $p < .001$.

11.3.4 Frequent/infrequent self-mutilation group comparisons

Mean scores and standard deviations for frequent and infrequent self-mutilation participants for each section of the CROSS are presented in Table 42.

Table 42.
Mean scores and standard deviations for frequent and infrequent self-mutilation groups for each section of the CROSS.

CROSS section	Frequent SM		Infrequent SM	
	M	SD	M	SD
Presence of Cognitive Rehearsal	3.12	(1.06)	2.18	(0.82)**
Covert Conditioning	2.94	(1.08)	2.07	(0.56)**
Covert Reinforcement	2.15	(1.07)	2.06	(0.49)
Circumstances				
Depression	2.74	(0.96)	1.59	(0.73)***
Extrapunitive	1.50	(0.71)	1.43	(0.79)
Alienation	2.98	(1.19)	1.40	(0.63)***
Operant	1.52	(0.69)	1.66	(0.92)
Modelling	1.64	(0.79)	1.33	(0.56)
Avoidance	2.30	(1.04)	1.40	(0.48)**
Tension reduction	1.96	(1.11)	1.29	(0.50) *
Janus face	2.71	(1.10)	1.67	(0.99)**
Intropunitive	2.77	(1.21)	1.41	(0.67)***
Quality of Cognitive Rehearsal	2.64	(0.62)	2.44	(0.58)
Intrusive Thoughts	2.56	(1.27)	1.29	(0.55)**
Control over Thoughts and Actions	3.35	(0.91)	3.21	(0.87)

* $p < .05$, ** $p < .01$, *** $p < .001$.

Significant differences between frequent and infrequent self-mutilation groups were demonstrated for the Presence of Cognitive Rehearsal, Covert Conditioning and Intrusion subscales of the CROSS. Frequent self-mutilation participants reported a significantly higher degree of cognitive rehearsal, t (33) = 2.80, $p < .01$; a significantly higher degree of covert conditioning, t (33) = 2.78, $p < .01$; and a significantly higher degree of intrusive thoughts, t (33) = 3.52, $p < .01$; than the infrequent self-mutilation group.

In addition, significant differences between frequent and infrequent self-mutilation groups were noted for 6 of the 9 Circumstances subscales. Frequent self-mutilation participants scored significantly higher than the infrequent group for the

Depression, t (33) = 3.82, $p < .001$; Alienation, t (33) = 4.54, $p < .0001$; Avoidance, t (33) = 3.04, $p < .01$; Tension Reduction, t (33) = 2.12, $p < .05$; Janus Face, t (33) = 2.85, $p < .01$; and Intropunitive subscales, t (33) = 3.81, $p < .001$.

For the frequent self-mutilation group, a significant variation between scores for the subscales for the Circumstances section was evident, F (8, 188) = 12.02, $p < .0001$. Post hoc analyses indicated that there were no significant differences between mean scores for the Alienation, Janus Face, Depression and Intropunitive subscales. Mean score for Alienation was significantly higher than for all other subscales (Fisher LSD = 0.48, $p < .05$). Mean scores for Janus Face, Depression and Intropunitive did not differ significantly from the Avoidance subscale but were significantly higher than for all remaining subscales (Fisher LSD = 0.48, $p < .05$). No significant difference between the Avoidance and Tension Reduction subscale was noted. However, the mean score for Avoidance was significantly higher than for Operant, Modelling and Extrapunitive subscales (Fisher LSD = 0.48, $p < .05$). Tension Reduction, Operant, Modelling and Extrapunitive items were least frequently endorsed. Mean scores for these subscales did not differ significantly from each other for the frequent self-mutilation group.

For the infrequent self-mutilation group, no significant variation in the Circumstances subscales scores were evident.

11.4 DISCUSSION

Results have indicated that individuals who self-mutilate do engage in cognitive rehearsal of the behaviour and that this process influences the development of a repetitive pattern of self-mutilation. The majority of participants reported having engaged in cognitive rehearsal of self-mutilation to some extent and results indicated that the behaviour was subject to a moderate degree of covert conditioning and covert reinforcement.

Current self-mutilation participants reported recently having engaged in a significantly higher frequency of self-mutilation-related thoughts than the recovered group. In addition, the current group reported a significantly higher degree of covert conditioning than recovered self-mutilation participants. These results have supported the notion that cognitive rehearsal of self-mutilation does influence actual performance of the behaviour.

Frequent self-mutilation participants reported experiencing a significantly higher degree of cognitive rehearsal of self-mutilation and considered these thoughts to be more intrusive than the infrequent group. In addition, the frequent group scored significantly higher than infrequent self-mutilation participants for covert conditioning of self-mutilative behaviour. Participants noted that the more frequently they thought about self-mutilation, the more frequently they engaged in the behaviour. These results have indicated that, to some extent, a repetitive pattern of self-mutilation is influenced by cognitive rehearsal of the behaviour and that the

individual has limited control over the self-mutilation related thoughts.

Previous research has demonstrated the importance of cognitive rehearsal in the acquisition of an adaptive behavioural response (Cautela, 1976, 1977; Cautela & Baron, 1977; Driskell et al., 1994; Huesmann & Eron, 1984; Lennings, 1994). Results of the present study have illustrated that cognitive rehearsal also is an important factor in the development and maintenance of maladaptive behaviours such as self-mutilation. Previous research has demonstrated that the efficacy of cognitive rehearsal is moderated by a number of factors (Driskell et al., 1994). The intermittent nature of cognitive rehearsal of self-mutilation and the fact that cognitive rehearsal is associated with the precipitants of the behaviour itself would add to the power of the influence of cognitive rehearsal on the actual performance of self-mutilation.

Some participants reported elaborate cognitive rehearsal of self-mutilation that involved detailed imagery of the act of self-mutilation. For others, images or thoughts of self-mutilation were more fleeting and less well defined. Results have indicated that this variation in quality or detail of imagery or thoughts associated with self-mutilation does not significantly affect the reinforcing qualities of cognitive rehearsal.

Females reported significantly more detailed cognitive rehearsal of self-mutilation than male participants. However, there was no significant difference between males and females for covert

conditioning of self-mutilation and, as described in Chapter 5, no significant differences between males and females for nature and extent of self-mutilative behaviour. In addition, there was no significant difference between frequent and infrequent self-mutilation groups for quality of rehearsal. However, presence of cognitive rehearsal and covert conditioning did distinguish frequent from infrequent self-mutilation participants. It is apparent that the frequency of cognitive rehearsal is more related to development of a repetitive pattern of self-mutilation than the quality of that rehearsal.

Frequent self-mutilation participants reported a significantly higher rate of intrusion for self-mutilation related thoughts than the infrequent group. No other between group differences were demonstrated for the Intrusion section of the CROSS. These results have provided support for the proposition that the intrusiveness of self-mutilation related thoughts contributes to the development of a repetitive pattern of self-mutilative behaviour. Indeed, research has demonstrated that intrusive thoughts are positively associated with behavioural engagement (Reese, Kliewer & Suarez, 1997).

Results of the second study in the present investigation demonstrated that frequent self-mutilation participants were experiencing a significantly higher degree of symptomatology and psychological distress than the infrequent group and that it was this level of distress that mediates the need to engage in self-mutilative behaviour. Research has indicated a strong relationship between the experience of intrusive thoughts and psychological distress (Baider &

De Nour, 1997). It is suggested that the level of distress experienced by the frequent group may render these individuals vulnerable to intrusive thoughts about self-mutilation leading to a higher rate of covert conditioning of self-mutilative behaviour.

Although a moderate degree of cognitive rehearsal was reported by the total sample of participants, the actual act of self-mutilation often was reported to occur in the absence of detailed forethought and participants reported little control of the act of self-mutilation. These results are in accordance with previous reports that have noted the lack of impulse control associated with the act of self-mutilation (Bennum, 1983; Evans et al., 1996; Favazza & Conterio, 1989; Gardner & Gardner, 1975; Graff & Mallin, 1967; Novotny, 1972; Pattison & Kahan, 1983; Simeon et al., 1992; Stanley et al., 1992).

Participants reported that actual performance of self-mutilative behaviour did not necessarily follow immediately from self-mutilation related thoughts. The specific contribution of covert processes to the cycle of self-mutilative behaviour remains unclear. Modification of the CROSS to incorporate items that assess the duration between cognitive rehearsal and actual execution of self-mutilation and any alteration in the nature of cognitive rehearsal over this time may clarify this issue.

Results have suggested that cognitive rehearsal of self-mutilation provides intermittent reinforcement of self-mutilative behaviour. Indeed, research has demonstrated that intermittent

reinforcement in this manner serves to strengthen the overt behavioural response (Cautela & Kearney, 1986). These results have important implications for the treatment of self-mutilation. The importance of incorporating some manipulation of the covert processes associated with self-mutilation should not be underestimated. However, in order to do so effectively, precise identification of the circumstances that lead individuals to think about self-mutilation is required.

Participants reported that feelings of alienation, ambivalence regarding suicide, depression and a need for self-punishment were most commonly associated with thoughts about self-mutilation. Interpersonal circumstances (i.e., Extrapunitive, Operant and Modelling) were least often reported to promote thoughts about self-mutilation. No significant differences between the interpersonal subscales and the Tension Reduction subscale were evident for the Circumstances section of the CROSS. In fact, results indicated that tension and anxiety were significantly less likely than depression-related feelings to lead to thoughts about self-mutilation. This distinction was particularly evident for the frequent self-mutilation group.

These results were unexpected. Given that tension reduction was reported to be the primary motive for actually engaging in self-mutilation, it was expected that feelings of tension and anxiety would be associated with cognitive rehearsal of self-mutilation to a substantial degree. Instead, results have indicated that the events

that precipitate self-mutilation are associated with a range of depressive feelings and that this negative emotional state promotes thoughts of self-mutilation. Reports have noted that as these negative feelings escalate, tension becomes the primary affect (Herpertz, 1995; Simpson, 1975, 1976). It is suggested that it is the heightened state of arousal that is associated with tension and anxiety, rather than self-mutilation related thoughts, that triggers actual performance of the behaviour.

This exploratory study has provided some insight regarding the covert processes associated with self-mutilation. In particular, results have indicated that cognitive rehearsal contributes to the development and maintenance of a repetitive pattern of self-mutilative behaviour. This has highlighted the need to incorporate cognitive strategies such as thought stopping and self-instructional training in any therapeutic programme for self-mutilation. Results have supported the proposition that alteration of the covert processes associated with the act of self-mutilation would contribute substantially to the effective management of the behaviour. Indeed, it is suggested that a comprehensive treatment regime incorporating cognitive strategies such as thought stopping and self-instructional training in conjunction with strategies that aim to alter the psychophysiological and psychological reinforcement that the self-mutilative act provides is most appropriate for combating repetitive self-mutilation.

CHAPTER 12

SUMMARY AND CONCLUSIONS

12.1 SUMMARY OF RESULTS

Traditionally, research examining self-mutilation has been conducted using quite restricted samples of individuals who engage in the behaviour. Researchers have utilised inpatient populations (e.g., Darche, 1990; Gardner & Gardner, 1975; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Podvoll, 1969; Rosenthal et al., 1972; Roy, 1978; Simpson, 1975, 1976), specific diagnostic groups (Dulit et al., 1994; Schaffer et al., 1982; Simeon et al., 1992) and prisoner populations (Bach-y-Rita, 1974; Haines, Williams, Brain et al., 1995; Johnson & Britt, 1969; Jones, 1986; Thorburn, 1984; Yaroshevsky, 1975) to investigate self-mutilative behaviour. A review of the literature has indicated that although there is some diversity in the nature of the samples themselves, the type and extent of the self-mutilative behaviour described are quite uniform.

In particular, previous research has focused almost exclusively on females who self-mutilate (e.g., Favazza & Conterio, 1989; Graff & Mallin, 1967; Herpertz, 1995; Langbehn & Pfohl, 1993; Rosenthal et al., 1972). A profile of a typical individual who engages in self-mutilation has been based on this research (e.g., Favazza, 1992; Favazza & Rosenthal, 1993; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Pao, 1969; Rosenthal et al., 1972). Males have either been excluded from self-mutilation related research or their results have not been reported on the basis that they have been considered atypical (e.g., Favazza & Conterio, 1989; Graff & Mallin, 1967; Herpertz, 1995; Langbehn & Pfohl, 1993; Rosenthal et al., 1972).

However, there has been no direct comparison of the self-mutilative behaviour of males and females to clarify this perspective.

The present investigation utilised a self-referred, nonpatient and outpatient sample of male and female self-mutilation participants. The instruments used, type and sites of injury and severity of injury for the present sample were consistent with the nature and extent of self-mutilation that previously has been described. Participants generally, although not exclusively, were young and had begun to self-mutilate in adolescence. Most engaged in skin cutting. Other methods of self-mutilation were reported to a lesser extent. Self-mutilation was of low lethality and was associated with relatively low levels of suicidal intent. For a substantial proportion of individuals, self-mutilation was a repetitive behaviour. Almost half of the participants reported a history of attempted suicide, most commonly by self-poisoning or severe skin cutting. For some participants, attempted suicide represented a repetitive behavioural pattern. Due to the similarities between the present self-mutilation participants and the characteristics of self-mutilation samples described in previous research, it is suggested that subsequent results derived from the present sample are generalisable to a broader population of people who self-mutilate.

In an effort to clarify the issue regarding the perceived sex differences in the phenomenology of self-mutilation, the self-mutilative behaviour of male and female participants was compared. Results of the first study demonstrated that there were no substantial

differences in the nature and extent of self-mutilative behaviour exhibited by male and female participants. In fact, the traditional profile of an individual who self-mutilates applied equally well to male as to female participants.

Two other comparisons were made throughout this investigation. In an effort to identify factors that are associated with the cessation of the behaviour, comparisons between individuals who were currently engaging in self-mutilation and those who were no longer actively utilising the behaviour were conducted. It was suggested that identification of factors associated with cessation of the behaviour would provide important information regarding appropriate directions for treatment of self-mutilation.

It was important initially to determine that there were no significant differences in the nature and extent of self-mutilative behaviour described by current and recovered participants. None were evident, indicating that subsequent between group differences could be attributable to factors associated with cessation of the behaviour rather than to inherent differences between current and recovered participants in the nature of the behaviour itself.

Although a repetitive pattern of self-mutilative behaviour has been well documented (Favazza, 1992; Favazza & Conterio, 1989; Favazza & Rosenthal, 1993; Favazza & Simeon, 1995; Gardner & Gardner, 1975; Graff & Mallin, 1967; Kahan & Pattison, 1984; Ross & McKay, 1979; Walsh & Rosen, 1988) little research attention has been devoted to the specific elements that contribute to the development

of this repetitive pattern of behaviour. The third comparison in the present investigation considered individuals who frequently self-mutilated and those who had infrequently engaged in the behaviour.

Skin cutting was the primary method of self-mutilation reported by frequent and infrequent participants. Given their more extensive self-mutilative history, it was not suprising that the frequent group reported having engaged in a broader range of self-mutilative behaviours than infrequent self-mutilation participants. No differences between the groups in the site or severity of injury inflicted were noted. These results suggested that the development of a repetitive behavioural pattern was not attributable to initial differences in the type or severity of self-mutilation utilised.

In order to successfully treat any given behaviour it is important to fully understand the mechanisms that contribute to the performance and maintenance of that behaviour. The phenomenology of self-mutilation has been well documented (Favazza, 1992; Favazza & Rosenthal, 1993; Feldman, 1988; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Pattison & Kahan, 1983; Simpson, 1986). However, systematic research regarding the specific components of the act itself has been limited. The subsequent studies in the present investigation aimed to clarify the factors associated with the self-mutilative process.

A range of unpleasant feelings have been reported to precede self-mutilation (Favazza, 1992; Grunebaum & Klerman, 1967; Kahan & Pattison, 1984; Simpson, 1976; Schwartz et al., 1989). Feelings of

depression, anger, and particularly tension have been reported to precede the self-mutilative act (Favazza & Conterio, 1989; Favazza, 1992; Grunebaum & Klerman, 1967; Kahan & Pattison, 1984; Langbehn & Pfohl, 1993; Simpson, 1975, 1976; Schwartz et al., 1989; Stanley et al., 1992). It has been suggested that the unpleasant feelings that precede self-mutilation are not qualitatively different from the individual's long-standing affective traits (Herpertz, 1995; Simeon et al., 1992). Results of the second study supported this notion.

Self-mutilation participants evidenced a significantly higher degree of psychological maladjustment than the control group. In particular, elevated feelings of anxiety, depression and hopelessness were noted. The role of hostile feelings in self-mutilative behaviour has been emphasised (Bennum, 1983; Darche, 1990; Gardner & Gardner, 1975; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Pao, 1969; Raine, 1982; Roy, 1978; Simeon et al., 1992). Results of the second study have supported the conception that self-mutilative behaviour is a reflection of hostile feelings, particularly guilt, that are directed towards the self (Menninger, 1935; Raine, 1982).

Self-mutilation participants had not experienced a greater number or more severe recent stressful life events than control participants. However, results of the second study did suggest that individuals who self-mutilate may overreact to stressful experiences. Escalating feelings of distress may result from this oversensitivity and lead to the urge to act out this distress in the form of self-mutilation. In addition, results have suggested that the experience of

dissociative symptoms combined with the urge to act out hostile feelings directed towards the self may limit the individual's ability to control the impulse to self-mutilate when distressing feelings escalate.

There were no significant differences between males and females in the type or severity of symptoms reported. However, males scored higher for a measure of venturesomeness and females evidenced significantly higher scores for empathy. Further analysis indicated that these sex differences were not restricted to individuals who self-mutilate. Results were interpreted as suggestive of variation between the sexes in motivations for engaging in the behaviour. Subsequent studies addressed this issue.

Researchers have noted that individuals engage in self-mutilation in an effort to control or dissipate distressing emotional states (Favazza & Rosenthal, 1993). It made sense to consider that the need to engage in self-mutilation would be diminished if the unpleasant symptoms associated with the behaviour were controlled. However, cessation of self-mutilation could not be attributed to symptom resolution. Results have indicated that the unpleasant symptoms associated with self-mutilative behaviour may persist even when self-mutilation is no longer part of an individual's behavioural repertoire.

Results of the second study have supported the proposition that the need to self-mutilate is mediated by the degree of distress associated with the presence of unpleasant symptoms, rather than

the symptoms themselves. It may be that the elevated level of distress experienced by people who are currently self-mutilating makes it difficult to control the urge to act out these feelings of distress in the form of self-mutilation. Previous research has indicated that individuals who self-mutilate are not necessarily deficient in coping skills (Haines & Williams, 1997). Results of the present investigation lend support to the proposition that they are unable to access these skills effectively when distressed. Alteration in degree of distress experienced could not be attributed to medication or help seeking behaviour. The factors that alter the level of distress experienced by individuals who self-mutilate remain unclear.

As noted, researchers have suggested that individuals use self-mutilation as a means of coping with or gaining control over unpleasant feelings (Favazza & Conterio, 1989; Simpson, 1975, 1976; Solomon & Farrand, 1976). Therefore, it would be expected that individuals who had frequently self-mutilated would have exhibited a greater number or more severe unpleasant symptoms than individuals who had infrequently self-mutilated. Results of the second study supported this notion.

However, results suggested that development of a repetitive behavioural pattern may not be mediated by symptom severity alone. Although frequent self-mutilation participants evidenced a significantly higher degree of symptom severity for some measures than the infrequent group, infrequent self-mutilation participants were not symptom free and did evidence a significant degree of

psychological maladjustment. Results have provided support for the proposition that dissociative experiences and distress regarding the presence of symptoms are particularly relevant to the development of a repetitive pattern of self-mutilation. In addition, for individuals who only engage in a few episodes of self-mutilation, the behaviour may represent one form of a broader sensation seeking phenomenon. An examination of the motivations for engaging in the behaviour aimed to clarify this notion.

A range of motivations for engaging in self-mutilative behaviour have been documented (Bennum, 1983; Favazza, 1989a; Favazza & Conterio, 1989; Pattison & Kahan, 1983; Walsh & Rosen, 1988). In particular, reports have indicated that individuals self-mutilate in order to relieve feelings of intolerable tension (Bennum, 1983; Favazza & Conterio, 1989; Gardner & Gardner, 1975; Grunebaum & Klerman, 1967; Pattison & Kahan, 1983; Roy, 1978). Indeed, for the present sample, self-mutilative behaviour was motivated by the need to obtain relief from distressing feelings, particularly tension. For this sample, the social consequences of self-mutilation were not significant motivational factors for engaging in the behaviour.

No differences in motivations for self-mutilative behaviour were demonstrated between current and recovered self-mutilation participants suggesting that individuals who were no longer self-mutilating were still able to accurately recollect the reasons they had for engaging in the behaviour.

Although both males and females cited tension reduction as the primary reason for engaging in the behaviour, the motivations described by males were less well defined than those reported by females. For females, the distinction between internal and external motivations for self-mutilation was quite clear and the behaviour was primarily motivated by internal factors. Research has suggested that females generally are more introspective than males (Ingram et al., 1988). The lack of distinction between internal and external motivations for males may have reflected this comparative lack of introspection. Alternatively, purposes of the behaviour itself may not be as clear for males as it appears for females. The mechanisms of the self-mutilative act itself required investigation in order to clarify this issue.

In order to understand how discrete episodes of self-mutilation develop into a repetitive behavioural cycle it is necessary to clarify the specific purposes and mechanisms of the behaviour itself. As previously described, researchers consistently have reported that self-mutilation is a response to emotional distress and that the act itself serves to dissipate this unpleasant state (Coid et al., 1992; Favazza & Rosenthal, 1993; Haines, Williams, Brain et al., 1995; Offer & Barglow, 1960; Walsh & Rosen, 1988). Results of the third study indicated that both frequent and infrequent self-mutilation participants utilised self-mutilation as a means of alleviating feelings of distress. However, the specified motivations for engaging in the

behaviour were less distinct for infrequent than for frequent self-mutilation participants.

For frequent self-mutilation participants the distinction between internal and external motivations for self-mutilation was quite clear. The desire to reduce tension and express feelings of depression and self-punishment were reported to be of particular importance. External factors played a secondary motivational role for frequent self-mutilation participants. Although motivations were less well defined for infrequent self-mutilation participants, these individuals reported utilising self-mutilation as a response to feelings of distress in the same manner as the infrequent self-mutilation group. For the infrequent group, self-mutilation may be periodically employed, along with a range of other strategies, to effectively relieve transient negative emotional states. It was anticipated that investigation of the processes associated with the self-mutilative act for frequent and infrequent participants would clarify this notion.

Consistent reports regarding the tension reducing qualities of self-mutilation have suggested that the act itself serves to reduce the heightened psychophysiological state that is associated with feelings of distress and tension (Haines, Williams, Brain et al., 1995). Any internal reinforcement that the act provides may be sufficient to maintain self-mutilation as a behavioural response (Walsh & Rosen, 1988). It is clear that for self-mutilation to be managed effectively, the

reinforcement processes associated with the act itself need to be clearly defined.

Using guided imagery scripts depicting an episode of self-mutilation, the psychophysiological and psychological processes of the self-mutilative act have been outlined (Haines, Williams, Brain et al., 1995). Results elicited from this incarcerated sample of self-mutilation participants indicated that an immediate reduction in psychophysiological arousal occurs with the actual act of self-mutilation. A significant reduction in feelings of psychological distress was not evident until after the act of self-mutilation was complete. These results suggested that it is the immediate reduction in psychophysiological arousal that the act provides that serves to reinforce self-mutilative behaviour.

It was necessary to determine whether these results obtained using a male prisoner self-mutilation sample were generalisable to a broader population of people who self-mutilate. Results of the fourth study demonstrated no significant sex differences in the psychophysiological or psychological response to self-mutilation imagery suggesting that the behaviour serves the same purpose and is reinforced in the same way for both males and females.

Results have supported the notion that the act of self-mutilation provides an immediate reduction in both psychophysiological arousal and feelings of psychological distress for individuals who are currently engaging in the behaviour. A lag between the reduction of psychophysiological arousal and

psychological distress was evident only for the recovered self-mutilation group. These results have suggested that when an individual is no longer engaging in the behaviour, the psychological processes associated with the act itself may be reinterpreted. However, the psychophysiological arousal reduction qualities of the behaviour appear to remain the same.

Results have provided support for the proposition that it is the reduction in psychophysiological arousal the act provides that primarily serves to reinforce self-mutilation. A reduction in psychophysiological arousal to the act of self-mutilation was evident regardless of how many times the individual had engaged in the behaviour. No differences between frequent and infrequent self-mutilation groups' psychophysiological response to self-mutilation imagery were evident. However, it would appear that self-mutilation initially is experienced as a frightening event that is associated with limited psychological benefits. Results suggested that repetition of self-mutilation is associated with a decrease in the fear related to the behaviour and that the individual's interpretation of their psychophysiological state alters as the behaviour becomes habitual. These results have highlighted the importance of clarifying the role of cognitive processes associated with the behaviour in the development of a repetitive pattern of self-mutilation.

Researchers have emphasised the role of covert processes in behaviour acquisition (Cautela, 1976, 1977; Cautela & Baron, 1977; Driskell et al., 1994; Huesmann & Eron, 1984; Lennings, 1994).

Results of the final study of this investigation have supported the idea that cognitive rehearsal contributes to the development and maintenance of self-mutilation. Results suggested that individuals who self-mutilate do engage in cognitive rehearsal of self-mutilation and that this rehearsal may contribute to the performance of the behaviour. Current self-mutilation participants reported that they engaged in a significantly higher degree of cognitive rehearsal and experienced a significantly higher degree of covert conditioning of self-mutilative behaviour than recovered participants. In addition, the frequent self-mutilation group reported a significantly higher rate of cognitive rehearsal, a significantly higher degree of covert conditioning of self-mutilation and were significantly more prone to intrusive thoughts regarding self-mutilation than the infrequent group.

Given that tension reduction was reported to be the primary reason for engaging in the behaviour, it was expected that thoughts related to tension and anxiety would most often prompt thoughts regarding self-mutilation. Instead, results suggested that a complex range of emotions are associated with self-mutilation related thoughts. Participants reported that feelings of depression were most likely to lead to thoughts of self-mutilation. These results have supported the notion that as unpleasant feelings escalate, tension becomes the primary affect (Herpertz, 1995; Simpson, 1975, 1976) and that it is the heightened state of arousal associated with this tension,

rather than the emotions associated with the precipitants of the behaviour that triggers the act of self-mutilation.

Only one sex difference was evident for cognitive rehearsal. Female participants reported their cognitive rehearsal to be significantly more detailed than males. As mentioned earlier, research has suggested that females are more introspective than males (Ingram et al., 1988). The superior quality of their cognitive rehearsal may be a result of this introspection.

Results of the present investigation have contributed to the understanding of the processes associated with the self-mutilative act and identified a range of factors that are associated with the maintenance of the behaviour. These results have highlighted the importance of thorough assessment of the range of processes associated with the behaviour prior to the development of an effective therapeutic programme for the management of an individual's self-mutilation.

12.2 CONCLUSIONS

Self-mutilation has been described as a complex behaviour that is extremely difficult to treat (Feldman, 1988; Raine, 1982; Simpson, 1976; Thorburn, 1984; van Moffaert, 1990; Walsh & Rosen, 1988). However, the lack of comparative studies regarding the efficacy of varying treatment approaches has been noted (Feldman, 1988; Tantam & Whittaker, 1992). A plethora of explanations has been proposed to account for the development of self-mutilation as a

behavioural response. However, a consistently effective treatment regime for self-mutilative behaviour has not been developed.

Results of the present investigation have suggested that the precipitants of the behaviour and the processes associated with those precipitants indeed are complex. However, the purpose that the behaviour itself serves and the mechanisms of the self-mutilative act may be quite straightforward. Results have provided support for the notion that people self-mutilate because the act immediately and effectively provides relief from an unpleasant psychophysiological state. In addition, results have suggested that this psychophysiological arousal reduction associated with the self-mutilative act may begin with the first episode of self-mutilation.

For participants in the present investigation, feelings such as depression, anger, alienation and the desire for self-punishment were reportedly associated with the events that preceded self-mutilation. These factors varied between individuals who engaged in the behaviour. Researchers have noted, that as unpleasant feelings escalate, unbearable tension becomes the predominant affect that precedes self-mutilation (Herpertz, 1995; Simpson, 1975, 1976). Results of the present investigation have supported the notion that it is this experience of intolerable tension and anxiety that promotes self-mutilation. In the heightened state of psychophysiological arousal that accompanies escalating feelings of tension and anxiety, it may be extremely difficult for the individual to control the impulse to self-mutilate.

The variety of self-mutilative behaviours that have been reported and the range of instruments that have been used to inflict injury are a testimony to the desperation of the individual intent on self-mutilating. It has been suggested that finding a strategy that can better or even equal the tension reducing qualities of self-mutilation is a difficult task indeed (Graff & Mallin, 1967). Reports have indicated that self-mutilation is a behaviour that may wax and wane over a period of many years (Favazza & Rosenthal, 1993). Certainly there are people who stop engaging in the behaviour altogether. Identification of the factors that are associated with cessation of the behaviour would aid in the development of an effective treatment for self-mutilation.

Results from the present investigation have suggested that it is unlikely that people stop cutting themselves because the act no longer provides the desired relief from tension. It makes sense to consider that cessation of self-mutilative behaviour is more likely due to an alteration of the psychopathology or symptomatology experienced by the individual leading to a reduced need to engage in the behaviour. Results of this investigation have indicated that this is not necessarily the case.

Individuals who had recovered from self-mutilative behaviour had not necessarily resolved the symptoms that are associated with self-mutilation. However, they were significantly less distressed regarding the presence of these symptoms than individuals who were currently engaging in the behaviour.

Presently, the factors that alter this level of distress remain unclear. It may be that the development or utilisation of coping skills to manage the response to distressing symptomatology is associated with a change in the level of distress experienced by the self-mutilating individual.

It was of interest that self-mutilation participants in the present investigation did not report a greater number or more severe stressful life experiences than individuals who had never engaged in the behaviour. However, results did suggest that individuals who self-mutilate may be more likely to overreact to negative life experiences and may be unable to effectively manage the distress associated with unpleasant events. It is suggested that the development of coping skills associated with the management of feelings of distress rather than directed towards management of the event itself may be beneficial for people who self-mutilate.

A range of treatment strategies for the management of self-mutilation have been described (e.g., Favazza, 1996). Traditional psychological treatment techniques for self-mutilation typically have focused on the development of communication and coping skills (Ballinger, 1971; Graff & Mallin, 1967; Novotny, 1972; Simpson, 1976) and the substitution of self-mutilation for more adaptive tension reduction strategies (Gardner & Gardner, 1975; Graff & Mallin, 1967; Rosen & Thomas, 1984). These strategies have been reported to be less than adequate in the treatment of self-mutilative behaviour (Feldman, 1988; Raine, 1982; Simpson, 1976; Thorburn, 1984).

Individuals who self-mutilate are not necessarily deficient in general coping or problem solving skills (Haines & Williams, 1997). However, it seems that individuals who self-mutilate may be unable or unwilling to resist the impulse to self-mutilate long enough to consider alternative coping strategies. Rather, they use the strategy that most effectively dissipates the unpleasant state. Therefore, it would be beneficial to address the processes associated with the act of self-mutilation itself in an effort to bring the behaviour under control.

In addition, results of the present investigation have suggested that the beneficial psychophysiological processes associated with self-mutilation may persist even when the individual is no longer engaging in the behaviour. This may leave the individual vulnerable to reactivating the behaviour in times of distress. In order to prevent this from occurring, results of the present investigation support the proposition that a strategy that aims to alter the reinforcement processes of the self-mutilative act would be an appropriate treatment choice.

To extinguish the self-mutilative behaviour it would be necessary to prevent the reinforcer from occurring. Stress management techniques targeting the initial increase in tension would be required to prevent the escalation of unpleasant affect that precedes self-mutilation. However, it should be noted that as the behaviour becomes habitual, the factors that trigger self-mutilation become increasingly minor (Grunebaum & Klerman, 1967).

Therefore, although stress management techniques would form an important part of a treatment regime, it would be difficult to prevent the relatively low level arousal that precipitates self-mutilation in those who habitually engage in the behaviour.

The discrete nature of the immediate reinforcement the act provides, supports the proposition that covert sensitisation (Cautela, 1967) would be the treatment of choice for extinguishing self-mutilative behaviour. Covert sensitisation has been considered a punishment procedure as an aversive stimulus is presented following the response to be reduced (Cautela, 1967). It is effective because it prevents the maladaptive approach behaviour from occurring by altering the reinforcement associated with that behaviour. It is appropriate to consider self-mutilation as a maladaptive approach behaviour as it is associated with positive and reinforcing consequences, that of tension reduction. If these consequences were no longer associated with the behaviour it is unlikely that an individual would be motivated to engage in self-mutilation and could consider using more adaptive strategies to cope with feelings of distress. Other researchers have noted the potential of strategies such as covert sensitisation for the management of self-mutilation (e.g., Jurgela, 1993).

Results of the present investigation have suggested that some aspects of self-mutilation develop and alter as the behaviour becomes habitual. In addition, variation in some factors associated with the behaviour have been noted between males and females who self-

mutilate. These results have highlighted the importance of thorough assessment of all aspects of self-mutilative behaviour prior to embarking on any treatment programme. Assessment of psychological, psychophysiological and cognitive factors associated with the behaviour would facilitate the effective targeting of an individual treatment programme.

12.3 DIRECTIONS FOR FUTURE RESEARCH

The majority of research to date has considered the precursors of self-mutilation and causes of the behaviour (e.g. Carroll et al., 1980, 1981; Favazza, 1989a; Favazza & Conterio, 1989; Rosenthal et al., 1972; Walsh & Rosen, 1988), the characteristics of individuals who typically self-mutilate (e.g., Favazza & Conterio, 1988, 1989; Favazza & Rosenthal, 1993; Graff & Mallin, 1967; Grunebaum & Klerman, 1967, Simpson, 1975, 1976) and the psychopathology and symptoms associated with the behaviour (e.g., Dulit et al., 1994; Favazza, 1992; Haines et al., 1995; Herpertz, 1995; Langbehn & Pfohl, 1993; Simeon et al., 1992). This research has increased the understanding of the nature of self-mutilative behaviour and the characteristics of individuals who typically engage in that behaviour. More recently, the specific components of the self-mutilative act have been considered in an effort to clarify the factors that maintain self-mutilation as a behavioural response (e.g., Brain et al., in press, 1998; Haines, Williams, Brain et al., 1995). The present investigation has contributed to this knowledge. The next step is to utilise this

understanding in the development of an effective treatment regime for self-mutilation.

A review of the literature has demonstrated a lack of well structured research regarding treatment of self-mutilation (Feldman, 1988; Tantam & Whittaker, 1992). The majority of treatment outcome reports have been based on single case studies (e.g., Cox & Klinge, 1976; Kaminer & Shahar, 1987; Roback et al., 1972). In addition, these studies often have employed a variety of treatment interventions in combination. However, the direct contribution of each intervention strategy has been difficult to determine. A lack of long term follow-up also has prevented the efficacy of any successful strategy from being confirmed. The majority of treatment approaches have focused on wrist cutting behaviour (e.g., Rosen & Thomas, 1984). The application of these therapeutic strategies for the management of other forms of self-mutilation requires validation.

As mentioned, results of the present investigation have supported the proposition that covert sensitisation would be a most appropriate treatment for combating self-mutilative behaviour. Covert procedures for the management of self-mutilation have been recommended (Cautela & Baron, 1973) and covert sensitisation has been included in a treatment package developed to address self-burning in a single case (Cox & Klinge, 1976). Unfortunately, the design of the study prevented evaluation of the efficacy of individual components of the treatment programme. In addition, a single case study reported the successful elimination of repetitive wrist cutting

behaviour using covert sensitisation (Jurgela, 1993). Covert sensitisation also has been identified as an effective strategy in the treatment of severe nail biting (Daniels, 1974; Paquin, 1977). The efficacy of covert sensitisation as a treatment for various forms of self-mutilation requires verification.

Traditionally, treatment approaches for self-mutilation have focused on the development of coping skills (Ballinger, 1971; Graff & Mallin, 1967; Novotny, 1972; Simpson, 1976). Results of the present investigation have suggested that strategies such as coping skills for managing feelings of distress and oversensitivity may be particularly useful. The contribution of coping skills training in this manner for the management of self-mutilation requires clarification.

In order to more accurately assess the specific nature of the contribution of cognitive rehearsal to the performance of self-mutilation, some modification and validation of the CROSS is required. This would be a valuable pursuit as currently there are no other instruments available that consider the role of cognitive rehearsal on the development of self-mutilation. Furthermore, results of the present investigation have suggested that cognitive rehearsal of self-mutilation does affect the performance of the behaviour itself. In particular, results have provided support for the idea that strategies such as thought stopping would be beneficial for individuals who engage in repetitive self-mutilation to combat the intrusive thoughts that are related to the behaviour. Thought stopping has been incorporated in treatment approaches to self-

mutilation in single case studies (Kaminer & Shahar, 1987). However, the direct contribution of this technique to the management of self-mutilation has not been specifically determined.

Results of the present investigation have indicated that an individually tailored, multifaceted treatment approach for self-mutilation would be most appropriate. This need also has been recognised by other authors (e.g., Favazza, 1996; Walsh & Rosen, 1988). However, it is important to determine the efficacy and role of any given treatment strategy prior to its incorporation in a therapeutic regime. It is suggested that validation of a range of treatment strategies that are based on an understanding of the factors that contribute to the development and maintenance of self-mutilation is the next step for self-mutilation research.

Researchers have reported that a significant number of people who engage in habitual self-mutilation also report multiple suicide attempts (Favazza, 1992; Herpertz, 1995; Langbehn & Pfohl, 1993). Results of the present investigation have supported this notion. Research has demonstrated that a substantial proportion of individuals who engage in repeated parasuicidal behaviour, do so despite resolution of the problem situation that originally motivated the behaviour (Sakinofsky, 1990). Preliminary research has suggested that there is a specific pattern of anxiety reduction that occurs in some cases following the parasuicidal act of deliberate self-poisoning (Driscoll et al., 1996, 1997). It is suggested that this form of parasuicidal behaviour may be psychophysiologically reinforced in a

similar manner to self-mutilation and develop into a repetitive pattern of behaviour in this way. This notion has important implications for the management of parasuicidal behaviour and attempted suicide and requires further investigation.

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APPENDICES

APPENDIX A

Consent forms

EXAMPLE CONSENT FORM

SELF-MUTILATION PARTICIPANTS

I _____ consent to participate in the study being conducted by Dr. Chris Williams and Miss Kerryn Brain at the University of Tasmania in an attempt to understand why people deliberately harm themselves with the aim of developing a method of treatment. As a participant in this study you will be required to answer questions about the times you have deliberately harmed yourself, the way you think about the times you have deliberately harmed yourself, the way you feel in different situations and the way that you have been feeling lately. In addition, measurements of heart rate, breathing and blood pressure will be taken while you are asked to imagine a series of situations that you have selected. In order to measure your heart rate, etc., a number of electrodes will be attached to your body and left hand. Placement of these electrodes will produce minimal, if any, discomfort and all electrodes will be disinfected after use so that there is minimal risk of infection. Participation in this study is voluntary and you may withdraw from the study at any time by stating a wish to do so. If you have any questions about the study you may discuss them with Miss Kerryn Brain, who will also be available for consultation after the investigation should the need arise, or with your case manager.

I have read the information about this research and any questions I have asked have been answered to my satisfaction. I agree to participate in this investigation and understand that I may withdraw at any time. I agree that research data gathered for the study may be published provided that I cannot be identified as a participant.

Signature of participant_____ Date_____

I have explained this project and the implications of participation in it to this volunteer and I believe that the consent is informed and that he/she understands the implications of participation.

Signature of investigator_____ Date_____

EXAMPLE CONSENT FORM

CONTROL PARTICIPANTS

I _____ consent to participate in the study being conducted by Dr. Chris Williams and Miss Kerryn Brain at the University of Tasmania in an attempt to understand why people deliberately harm themselves with the aim of developing a method of treatment. As a participant in this study you will be required to answer questions about the way you feel in different situations and the way that you have been feeling lately. In addition, measurements of heart rate, breathing and blood pressure will be taken while you are asked to imagine a series of situations that you have selected. In order to measure your heart rate, etc., a number of electrodes will be attached to your body and left hand. Placement of these electrodes will produce minimal, if any, discomfort and all electrodes will be disinfected after use so that there is minimal risk of infection. Participation in this study is voluntary and you may withdraw from the study at any time by stating a wish to do so. If you have any questions about the study you may discuss them with Miss Kerryn Brain.

I have read the information about this research and any questions I have asked have been answered to my satisfaction. I agree to participate in this investigation and understand that I may withdraw at any time. I agree that research data gathered for the study may be published provided that I cannot be identified as a participant.

Signature of participant_____ Date_____

I have explained this project and the implications of participation in it to this volunteer and I believe that the consent is informed and that he/she understands the implications of participation.

Signature of investigator_____ Date_____

APPENDIX B

Interviews and scales used in Study 1

A. Self-mutilative behaviour checklist

Please indicate which behaviours you have engaged in, how often you have engaged in these behaviours, which instruments you have used and what parts of your body you have injured:

Behaviour	Frequency	Instruments used	Body parts injured
Skin-cutting	_____	_____	_____
		_____	_____
		_____	_____
Self-biting	_____	_____	_____
		_____	_____
		_____	_____
Skin-abrading	_____	_____	_____
		_____	_____
		_____	_____
Inserting objects under the skin	_____	_____	_____
		_____	_____
		_____	_____
Skin-burning	_____	_____	_____
		_____	_____
		_____	_____
Ingesting solid objects	_____	_____	_____
		_____	_____
		_____	_____
Self-hitting	_____	_____	_____
		_____	_____
		_____	_____

Behaviour	Frequency	Instruments used	Body parts injured
Hitting objects	_____	_____	_____
		_____	_____
		_____	_____
Wound excoriation	_____	_____	_____
		_____	_____
		_____	_____

When was the last time you injured yourself? _____

How many times have you deliberately injured yourself? _____

How long have you been deliberately injuring yourself? _____

How long had you been deliberately injuring yourself before you sought help? _____

B. Intent Score Scale (Pierce, 1977)

Circumstances

1.	Isolation	0	Somebody present.
		1	Somebody present or in contact (e.g., by phone).
		2	No-one nearby or in contact.
2.	Timing	0	Timed so intervention is probable.
		1	Timed so that intervention is not likely.
		2	Timed so that intervention is highly unlikely.
3.	Precautions against discovery and/or intervention	0	No precautions.
		1	Passive precautions.
		2	Active precautions (e.g., locked door).
4.	Acting to gain help during or after attempt	0	Notified potential helper.
		1	Contact but did not specifically notify potential helper.
		2	Did not contact or notify potential helper.
5.	Final acts in anticipation of death	0	None.
		1	Partial preparation.
		2	Definite plans made.
6.	Suicide note	0	Absence of note.
		1	Note written but torn up.
		2	Definite plans made.

Self-report

7.	Patient's statement of lethality	0 Thought that what he had done would not kill him. 1 Unsure if what he had done would kill him. 2 Thought what he had done would kill him.
8.	Stated intent	0 Did not want to die. 1 Uncertain or did not care if he lived or died. 2 Wanted to die.
9.	Premeditation	0 Impulsive, no premeditation. 1 Considered for less than one hour. 2 Considered for less than one day. 3 Considered for more than one day.
10.	Reaction to act	0 Patient glad he has recovered. 1 Patient uncertain whether he is glad or sorry. 2 Patient sorry he has recovered.

Risk

11.	Predictable outcome	0 Survival certain. 1 Death unlikely. 2 Death likely or certain.
12.	Would death have occurred without medical treatment	0 No. 1 Uncertain. 2 Yes.

C. Modified Scale for Suicidal Ideation (Miller, Norman, Bishop & Dow, 1986)

Instructions

The purpose of this scale is to assess the presence or absence of suicidal ideation and the degree of severity of suicidal ideas. The time frame is from the point of interview and the previous 48 hours.

1. Wish to die

Do you want to die now?
Over the past day or two have you thought about wanting to die?
(If the patient wants to die ask: Over the past day or two how often have you had the thought that you wanted to die? A little? Quite often? A lot? When you have wished for death, how strong has the desire been? Weak? Moderately strong? Very strong?

0 None - no current wish to die, hasn't had any thoughts about wanting to die.
1 Weak - unsure about whether he/she wants to die, seldom thinks about death, or intensity seems low.
2 Moderate - current desire to die, may be preoccupied with ideas about death, or intensity seems greater than a rating of 1.
3 Strong - current death wish, high frequency or high intensity during the past day or two.

2. Wish to live

Do you care if you live or die?
Over the past day or two have you thought that you want to live?
(If the patient wants to live ask: Over the past day or two how often have you thought about wanting to live? A little? Quite often? A lot? How sure are you that you really want to live?)

0 Strong - current desire to live, high frequency or high intensity.
1 Moderate - current desire to live, thinks about wanting to live quite often, can easily turn his/her thoughts away from death or intensity seems more than a rating of 2.
2 Weak - unsure about whether he/she wants to live, occasional thoughts about living or intensity seems low.
3 None - patient has no wish to live.

3. Desire to make an active suicide attempt

Do you want to kill yourself now?
Over the past day or two when you have thought about suicide did you want to kill yourself? How often? A little? Quite often? A lot?

0 None- patient may have had thoughts but does not want to make an attempt.
1 Weak - patient isn't sure whether he/she wants to make an attempt.
2 Moderate - wanted to act of thoughts at least once in the last 48 hours.
3 Strong - wanted to act on thoughts several times an/or almost certain he wants to kill self.

4. Passive suicide attempt

Right now would you deliberately ignore taking care of your health?
Do you feel like trying to die by eating too much (too little), drinking too much (too little), or by not taking needed medications?
Have you felt like doing any of these things over the past day or two?
Over the past day or two, have you though it might be goo to leave death to chance, for example, carelessly crossing a busy street, driving recklessly, or even walking alone at night in a rough part of town?

0 None - would take precautions to maintain life.
1 Weak - not sure whether he/she would leave life/death to chance, or has thought about gambling with fate at least once in the last two days.
2 Moderate - would leave life/death to chance, almost sure he/she would gamble.
3 Strong - avoided steps necessary to maintain or save life, e.g., stopped taking needed medications.

5. Duration of thoughts

Over the past day or two when you have thought about suicide how long did the thoughts last?
Were they fleeting, e.g., a few seconds?
Did they occur for a while then stop, e.g., a few minutes?
Did they occur for longer periods, e.g., an hour at a time?
Is it to the point where you can't seem to get them out of your mind?

0 Brief - fleeting periods.
1 Short duration - several minutes.
2 Longer - an hour or more.
3 Almost continuous - patient finds it hard to turn attention away from suicidal thoughts, can't seem to get them out of his/her mind.

6. Frequency of ideation

Over the last or two how often have you thought about suicide? Once a day? Once an hour? More than that? All the time?

0 Rare - once in the past 48 hours.
1 Twice or more over the last 48 hours.
2 Occurs approximately every hour.
3 Several times an hour.

7. Intensity of thoughts

Over the past day or two, when you have thought about suicide, have they been intense (powerful)? How intense have they been? Weak? Somewhat strong? Moderately strong? Very strong?

0 Very weak.
1 Weak.
2 Moderate.
3 Strong.

8. Deterrent to active attempt

Can you think of anything that would keep you from killing yourself? (Your religion, consequences for your family, chance that you might injure yourself seriously if unsuccessful).

0 Definite deterrent - wouldn't attempt suicide because of deterrents. Patient must name one deterrent.
1 Probable deterrent - can name at least one deterrent, but does not definitely rule our suicide.
2 Questionable deterrent - patient has trouble naming any deterrents, seems focused on the advantages to suicide, minimal concern over deterrents.
3 No deterrents - no concern over consequences to self or others.

9. Reasons for living and dying

Right now can you think of any reasons why you should stay alive?
What about over the past day or tow?
Over the past day or two have you thought that there are things happening in your life that make you want to die?
(It the patient says there are clear reasons for living and dying, ask what they are and write them verbatim in the section provided. Ask the remaining questions).

Living Dying

Do you think that your reasons for dying are better than your reasons for living?
Would you say that your reasons for living are better than your reasons for dying?
Are your reasons for living and dying about equal in strength, 50-50?

0 Patient has no reasons for dying, never occurred to him/her to weigh reasons.
1 Has reasons for living and occasionally has thought about reasons for dying.
2 Not sure about which reasons are more powerful, living and dying are about equal, or those for dying slightly outweigh those for living.
3 Reasons for dying strongly outweigh those for living, can't think of any reasons for living.

10. Method: Degree of specificity/planning

Over the last day or two have you been thinking about a way to kill yourself, the method you might use?
Do you know where to get these materials?
Have you thought about jumping from a high place? Where would you jump?
Have you thought about using a car to kill yourself? Your own? Someone else's? What highway or road would you use?
When would you try to kill yourself? Is there a special event (e.g., anniversary, birthday) with which you would like to associate your suicide?
Have you thought of any other ways you might kill yourself? (Note details verbatim).

0 Not considered, method not thought about.
1 Minimal consideration.
2 Moderate consideration.
3 Details worked out, plans well formulated.

11. Method: Availability/opportunity

Over the past day or two have you thought methods are available to you to commit suicide?
Would it take time/effort to create an opportunity to kill yourself?
Do you foresee opportunities being available to you in the near future (e.g., leaving hospital)?

0 Method not available, no opportunity.
1 Method would take time/effort, opportunity not readily available, e.g., would have to purchase poisons, get prescription, borrow or buy a gun.
2 Future opportunity or availability anticipated - if in hospital when patient got home, pills or gun available.
3 Method/opportunity available - pills, gun, car available, patient may have selected a specific time.

12. Sense of courage to carry out attempt

Do you think you have the courage to commit suicide?

0 No courage, too weak, afraid.
1 Unsure of courage.
2 Quite sure.
3 Very sure.

13. Competence

Do you think you have the ability to carry out your suicide?
Can you carry our the necessary steps to insure a successful suicide?
How convinced are you that you would be effective in bringing an end to your life?

0 Not competent.
1 Unsure.
2 Somewhat sure.
3 Convinced that he/she can do it.

14. Expectancy of actual event

Over the last day or two have you thought that suicide is something that you really might do sometime?
Right now what are the chances you would try to kill yourself if left to your own devices?
Would you say the chances are less than 50%? About equal? More than 50%?

0 Patient says he/she definitely would not make an attempt.
1 Unsure - might make an attempt but the chances are less than 50% or about equal.
2 Almost certain - chances are greater than 50% that he/she would try to commit suicide.
3 Certain - patient will make an attempt if left by self (i.e., if not in hospital or not watched).

15. Talk about death/suicide

Over the last day or two have you noticed yourself talking about death more than usual?
Can you recall whether or not you spoke to anybody, even jokingly, that you might welcome death or try to kill yourself?
Have you confided in a close friend, religious person or professional helper that you intend to commit suicide?

0 No talk of death/suicide.
1 Probably talked about death more than usual but no specific mention of death wish. May have alluded to suicide using humour.
2 Specifically said that he/she wants to die.
3 Confided that he/she plans to commit suicide.

16. Writing about death/suicide

Have you written about death/suicide e.g., poetry, in a personal diary?

0 No written material.
1 General comments regarding death.
2 Specific reference to death wish.
3 Specific reference plans for suicide.

17. Suicide note

Over the last day or two have you thought about leaving a note or writing a letter to somebody about your suicide?
Do you know what you'd say? Who would you leave it for? Have you written it out yet? Where did you leave it?

0 None - hasn't thought about a suicide note.
1 "Mental note" - has thought about a suicide note, those he/she might give it to, possible worked out general themes which would be put in the note (e.g., being a burden to others, etc.).
2 Started - suicide note partially written, may have misplaced it.
3 Completed note - written out, definite plans about content, addressee.

18. Actual preparation

Over the past day or two have you actually done anything to prepare for your suicide, e.g., collected material, guns, pills, etc.?

0 None - no preparation.
1 Probable preparation - patient not sure, may have started to collect materials.
2 Partial preparation - definitely started to organise method of suicide.
3 Complete - has pills, gun or other devices that he needs to kill self.

D. History of suicidal behaviour

Have you attempted suicide in the past? Yes No

How many times?_____

What methods did you use?

- ☐ Gunshot
- ☐ Hanging
- ☐ Self-poisoning - drugs
- ☐ Self-poisoning - other poisonous substances
- ☐ Gas
- ☐ Precipitation
- ☐ Self-immolation
- ☐ Severe cutting/stabbing
- ☐ Electrocution

Have you ever been hospitalised because of a suicide attempt? Yes No

APPENDIX C

Mean scores and standard deviations for the Intent Score Scale

Table 4.
Mean scores and standard deviations for the current and recovered self-mutilation groups for the Intent Score Scale.

Intent Score Subscale	Current SM		Recovered SM	
	M	SD	M	SD
Circumstances	6.14	(2.08)	5.36	(2.31)
Self-report	1.71	(2.24)	1.36	(1.70)
Medical risk	0.38	(0.67)	0.36	(1.22)
Total	8.24	(3.51)	7.00	(3.03)

Table 5.
Mean scores and standard deviations for male and female self-mutilation participants for the Intent Score Scale.

Intent Score Subscale	Male SM		Female SM	
	M	SD	M	SD
Circumstances	5.84	(1.89)	5.63	(2.45)
Self-report	1.32	(1.97)	1.67	(1.96)
Medical risk	0.05	(0.23)	0.59	(1.25)
Total	7.21	(2.66)	7.81	(3.68)

APPENDIX D

Interview schedules and scales used in Study 2

A. Interview schedule

1. Demographic information

Name.....

Contact address.....

.....

Telephone.....

Sex: Male/Female

Age.....

2. Diagnosis and hospital information

Diagnosis or description of major symptoms.....

.....

.....

Age at onset.....

Duration of illness.....

Have you ever been hospitalised for the treatment of self-mutilative behaviour or psychiatric illness? Yes/No.

Number of hospitalisations.....

Year of most recent hospitalisation.....

Age at first hospitalisation.....

Longest single hospital stay.....

3. Medication

Are you currently taking any medication? If so, what kind?.....

.....

Are you taking more that one kind of medication?.....

How long have you been taking medication?.....

4. Allergies

Do you have a history of severe skin sensitivity or allergic skin reactions to everyday substances (e.g., soap, cosmetics, bandaids, ointments, etc)? Yes/No.

B. Schedule of Recent Experience (Holmes, 1976)

Part A

Think back on each possible life event listed below, and decide if it happened to you within the last year. If the event did happen, mark the space next to it.

	Check here if event happened to you	Mean value
1. A lot more or a lot less trouble with the boss.	_____	_____
2. A major change in sleeping habits (sleeping a lot more or a lot less, or change in part of the day when asleep).	_____	_____
3. A major change in eating habits (a lot more or a lot less food intake, or very different meal hours or surroundings).	_____	_____
4. A revision of personal habits (dress, manners, associations, etc.).	_____	_____
5. A major change in your usual type and/or amount of recreation.	_____	_____
6. A major change in your social activities (clubs, dancing, movies, visiting, etc.).	_____	_____
7. A major change in church activities (a lot more or a lot less than usual).	_____	_____
8. A major change in number of family get-togethers (a lot more or a lot less than usual).	_____	_____
9. A major change in financial state (a lot worse off or a lot better off than usual).	_____	_____
10. In-law troubles.	_____	_____
11. A major change in number of arguments with a spouse (a lot more or a lot less than usual regarding child-rearing, personal habits, etc).	_____	_____
12. Sexual difficulties.	_____	_____

Part B

In the space provided, indicated the number of times that each applicable event happened to you within the last two years.

	Number of times	Mean value	Score
13. Major personal injury or illness.	_____	_____	_____
14. Death of a close family member other than spouse).	_____	_____	_____
15. Death of spouse.	_____	_____	_____
16. Death of a close friend.	_____	_____	_____
17. Gaining a new family member (through birth, adoption, oldster moving in, etc).	_____	_____	_____
18. Major change in the health or behaviour of a family member.	_____	_____	_____
19. Change in residence.	_____	_____	_____
20. Detention in jail or another institution.	_____	_____	_____
21. Minor violations of the law (traffic tickets, jaywalking, disturbing the peace, etc).	_____	_____	_____
22. Major business readjustment.	_____	_____	_____
23. Marriage.	_____	_____	_____
24. Divorce.	_____	_____	_____
25. Marital separation from spouse.	_____	_____	_____
26. Outstanding personal achievement.	_____	_____	_____
27. Son or daughter leaving home (marriage, attending college, etc).	_____	_____	_____
28. Retirement from work.	_____	_____	_____
29. Major change in working hours or conditions.	_____	_____	_____
30. Major change in responsibilities at work (promotion, demotion, lateral transfer).	_____	_____	_____
31. Being fired from work.	_____	_____	_____
32. Major change in living conditions (building a new home, remodelling, deterioration of home or neighbourhood).	_____	_____	_____
33. Wife beginning or ceasing work outside the home.	_____	_____	_____

34. Taking on a mortgage greater than $25,000 (purchasing a home, business, etc).	_____	_____	_____
35. Taking on a mortgage or loan for less than $25,000 (purchasing a car, TV, freezer, etc).	_____	_____	_____
36. Foreclosure on a mortgage or loan.	_____	_____	_____
37. Vacation.	_____	_____	_____
38. Changing to a new school.	_____	_____	_____
39. Changing to a different line of work.	_____	_____	_____
40. Beginning or ceasing formal schooling.	_____	_____	_____
41. Marital reconciliation.	_____	_____	_____
42. Pregnancy.	_____	_____	_____
		Total score:	_____

C. Dissociative Experiences Scale (Burnstein & Putnam, 1986)

This questionnaire consists of twenty-eight questions about the experiences that you may have in your daily life. We are interested in how often you have these experiences. It is important however, that your answers show how often these experiences happen to you when you are not under the influence of alcohol or drugs. To answer the questions, please determine to what degree the experience described in the question applies to you and mark the line with a vertical slash at the appropriate place.

1. Some people have the experience of driving a car and suddenly realising that they don't remember what has happened during all or part of the trip. Mark the line to show what percentage of the time this happens to you.

0% 100%

2. Some people find that sometimes they are listening to someone talk and they suddenly realise that they did not hear all or part of what was just said. Mark the line to show what percentage of the time this happens to you.

0% 100%

3. Some people have the experience of finding themselves in a place and having no idea how they got there. Mark the line to show what percentage of the time this happens to you.

0% 100%

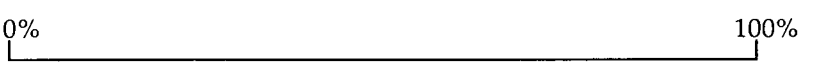
4. Some people have the experience of finding themselves dressed in clothes that they don't remember putting on. Mark the line to show what percentage of the time this happens to you.

5. Some people have the experience of finding new things among their belongings that they do not remember buying. Mark the line to show what percentage of the time this happens to you.

6. Some people sometimes find that they are approached by people that they do not know who call them by another name or insist that they have met them before. Mark the line to show what percentage of the time this happens to you.

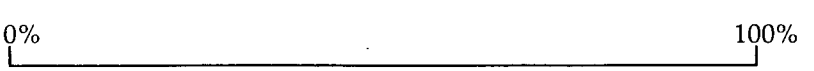
7. Some people sometimes have the experience of feeling as though they are standing next to themselves or watching themselves doing something and actually see themselves as though they are looking at another person. Mark the line to show what percentage of the time this happens to you.

8. Some people are told that they sometimes do not recognise friends or family members. Mark the line to show what percentage of the time this happens to you.



9. Some people find that they have no memory for some important events in their life (e.g., wedding or graduation). Mark the line to show what percentage of the time this happens to you.

10. Some people have the experience of being accused of lying when they do not think that they have lied. Mark the line to show what percentage of the time this happens to you.



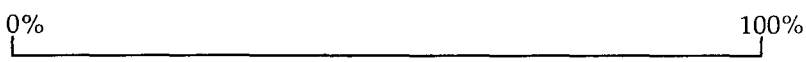
11. Some people have the experience of looking in the mirror and not recognising themselves. Mark the line to show what percentage of the time this happens to you.

12. Some people sometimes have the experience of feeling that other people, objects, and the world around them are not real. Mark the line to show what percentage of the time this happens to you.

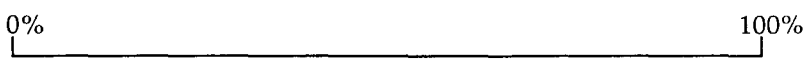
13. Some people sometimes have the feeling that their body does not seem to belong to them. Mark the line to show what percentage of the time this happens to you.

14. Some people have the experience of sometimes remembering a past event so vividly that they feel as if they were reliving that event. Mark the line to show what percentage of the time this happens to you.

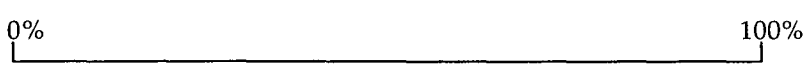
15. Some people have the experience of not being sure whether they remember really did happen or whether they just dreamed them. Mark the line to show what percentage of the time this happens to you.



16. Some people have the experience of being in a familiar place but finding it strange and unfamiliar. Mark the line to show what percentage of the time this happens to you.



17. Some people find that when they are watching television or a movie they become so absorbed in the story that they are unaware of other events happening around them. Mark the line to show what percentage of the time this happens to you.

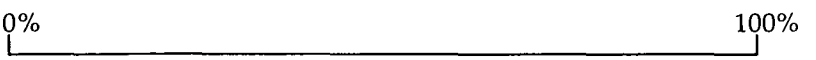


18. Some people sometimes find that they become so involved in a fantasy or daydream that it feels as though it were really happening to them. Mark the line to show what percentage of the time this happens to you.

19. Some people find that they sometimes are able to ignore pain. Mark the line to show what percentage of the time this happens to you.

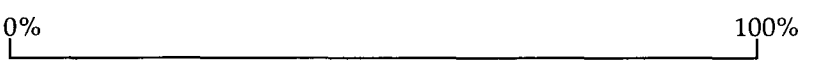
20. Some people find that they sometimes sit, staring off into space, thinking of nothing and are not aware of the passing passage of time. Mark the line to show what percentage of the time this happens to you.

21. Some people sometimes find that when they are alone they talk out loud to themselves. Mark the line to show what percentage of the time this happens to you.



22. Some people find that in one situation they may act so differently compared with another situation that they feel almost as though they were two different people. Mark the line to show what percentage of the time this happens to you.

23. Some people sometimes find that in certain situations they are able to do things with amazing ease and spontaneity that would usually be difficult for them (e.g., sports, work, social situations). Mark the line to show what percentage of the time this happens to you.



24. Some people sometimes find that they cannot remember whether they have done something or have just thought about doing that thing (e.g., not knowing whether they have mailed a letter or have just thought about mailing it). Mark the line to show what percentage of the time this happens to you.

25. Some people sometimes find writings, drawings or noted among their belongings that they must have done but cannot remember doing. Mark the line to show what percentage of the time this happens to you.

26. Some people sometimes find that they hear voices inside their head that tell them to do things or comment on things that they are doing. Mark the line to show what percentage of the time this happens to you.

27. Some people sometimes feel as though they are looking at the world through a fog so that people and objects appear far away or unclear. Mark the line to show what percentage of the time this happens to you.

D. Eysenck Impulsiveness Questionnaire (Eysenck & Eysenck, 1978)

Please answer yes or no to the following questions:

1. Would you enjoy water skiing?
2. Do public displays of affection annoy you?
3. Do you often long for excitement?
4. Usually do you prefer to stick to brands you know are reliable to trying new ones on the chance of finding something better?
5. Would you feel sorry fora lonely stranger in a group?
6. Do you quite enjoy taking risks?
7. Do you feel at your best after having a couple of drinks?
8. Do you often get emotionally involved with your friends' problems?
9. Do you save regularly?
10. Would you enjoy parachute jumping?
11. Do you think that people are too concerned about the feelings of animals?
12. Do you often buy things on impulse?
13. Would you prefer a job involving change, travel and variety even though it might be insecure?
14. Do unhappy people who feel sorry for themselves irritate you?
15. Do you generally say things without stopping to think?
16. Do you prefer quiet parties with good conversation to 'wild' uninhibited ones?
17. Are you inclined to feel nervous when others around you seem to be nervous?
18. Do you often get into a jam because you do things without thinking?
19. Do you think that hitch-hiking is too dangerous a way to travel?
20. Do you find it silly to cry out of happiness?
21. Would you often like to get high (using alcohol or drugs)?
22 Do you like diving off the high board?
23 Do people you are with have a strong influence on your moods?
24. Are you an impulsive person?
25. Do you welcome new and exciting experiences and sensations, even if they are a little frightening and unconventional?
26. Does it effect you very much when one of your friends seems upset?
27. Do you usually think carefully before doing anything?
28. Would you like to learn to fly an aeroplane?
29. Do you ever get deeply involved with the feelings of a character in a film, play or novel?
30. Do you often do things on the spur of the moment?
31. When the odds are against you, do still usually think it is worth taking a chance?
32. Do you get very upset when you see someone cry?
33. Do you often enjoy breaking rules you consider unreasonable?
34. Are you rather cautious in unusual situations?
35. Do you sometimes find someone else's laughter catching?
36. Do you mostly speak before thinking things out?
37. Would you make quite sure that you had another job before giving up your old one?
38. Are you generally calm, even when others around you are worried?
39. Do you often get involved in things you later wish you could get out of?
40. Do you prefer traditional to new, unusual and sometimes discordant music?
41. When a friend starts to talk about his/her problems, do you try and change the subject?
42. Do you get so carried away by new and exciting ideas that you never think of the possible snags?
43. Do you find it hard to understand people who risk their necks climbing mountains?
44. Can you make decisions without worrying about other people's feelings?
45. Do you get bored more easily than most people doing the same old thing?
46. Do you prefer friend who are reliable to those who are excitingly unpredictable?
47. Do you find it hard to understand why some things upset people so much?
48. Would you agree that planning things ahead takes the fun out of life?
49. Do you sometimes like doing things that are a bit frightening?
50. Can you remain in a good mood even if those around you are depressed?

51. Do you need to use a lot of self control to keep out of trouble?
52. Would life with no danger be too dull for you?
53. Do you become more irritated than sympathetic when you see someone cry?
54. Would you agree that almost everything enjoyable is illegal or immoral?
55. Generally do you prefer to enter cold sea water gradually to diving or jumping straight in?
56. Are you often surprised at people's reactions to what you do or say?
57. Do you get extremely impatient if you are kept waiting by someone who is late?
58. Would you enjoy the sensation of skiing very fast down a high mountain slope?
59. Do you like watching people open presents?
60. Do you think that an evening out is more successful if it is unplanned or arranged at the last moment?
61. Would you like to go scuba diving?
62. Would you find it very hard to break bad news to someone?
63. Do you get very restless if you have to stay around home for any length of time?

E. Impulsive Behaviours Questionnaire

Please answer yes or no to the following questions.

1. Are you prone to outbursts of anger?
2. Have you ever tried unsuccessfully to stop gambling?
3. Have you ever gone on eating binges where you have felt that you could not stop?
4. Do you have a tendency to drink or use drugs to excess?
5. Do you get bored or irritated easily?
6. Have you ever shoplifted?
7. Do you sometimes get angry over trivial things?
8. Have you ever deliberately set fires for no apparent reason?
9. Do you have to be careful of your tendency to abuse drugs or alcohol?
10. Have you ever gambled on a regular basis?
11. Have you ever pulled out your hair (including body hair, eyelashes, etc)?
12. Do you do things impulsively that you regret having done?
13. Have you had multiple sexual partners?
14. Have you ever been unable to resist the urge to steal something?
15. Have you ever made yourself vomit after eating?
16. Do you pull out hair when you are feeling stressed, or distracted (e.g., watching T.V.)?
17. Do you say things impulsively that you regret having said?
18. Do you ever buy things that you don't really need or can't really afford?
19. Do you tend to act on the 'spur of the moment' without thinking things through?

F. Reasons for Living Inventory-48 (Linehan, Goodstein, Nielsen & Chiles, 1983)

Many people have thought of suicide at least once, others have never considered it. Whether you have considered it or not, we are interested in the reasons you would have for **not** committing suicide **if** the thought were to occur to you or **if** someone were to suggest it to you. We would like to know how important each of these statements would be to you at this time in your life as a reason to **not** kill yourself.

Each reason can be rated for 1 (not at all important) to 6 (extremely important). If a reason does not apply to you or if you do not believe that the statement is true, then it is not likely to be important and you should put a 1. Please use the whole range of choices so as not to rate only at the middle (2, 3, 4, 5) or at the extremes (1, 6). In the space provided at the end of each question please put a number to indicated the importance to you of each reason for **not** killing yourself.

1	Not at all important (as a reason for not killing myself, or, does not apply to me).
2	Quite unimportant.
3	Somewhat unimportant.
4	Somewhat unimportant.
5	Quite important.
6	Extremely important (as a reason for not killing myself).

Even if you have never or firmly believe that you never would seriously consider killing yourself, it is still important that you rate each reason. In this case, rate on the basis of why killing yourself is not, or would never be an alternative for you. Regardless of whether you agree or disagree with these statements, please try to think of them as possible reasons for not killing yourself and rate their importance to you from 1 - 6 on this basis.

1. I have a responsibility and commitment to my family. _____
2. I believe I can learn to adjust or cope with my problems. _____
3. I believe I have control over my life and destiny. _____
4. I have a desire to live. _____
5. I believe only God has the right to end a life. _____
6. I am afraid of death. _____
7. My family might believe that I did not love them. _____
8. I do not believe that things get miserable or hopeless enough that I would rather be dead. _____
9. My family depends upon me and needs me. _____
10. I do not want to die. _____
11. I want to watch my children as they grow. _____
12. Life is all we have and it's better than nothing, _____
13. I have future plans I am looking forward to carrying out. _____
14. No matter how badly I feel, I know that it will not last. _____
15. I am afraid of the unknown.
16. I love and enjoy my family too much to leave them. _____
17. I want to experience all that life has to offer and there are many experiences I haven't had yet which I want to have. _____
18. I am afraid that my method of killing myself would fail. _____
19. I care enough about myself to live. _____
20. Life is too beautiful and precious to end it. _____
21. It would not be fair to leave the children to others to take care of. _____
22. I believe I can find other solutions to my problems. _____
23. I am afraid of going to hell. _____
24. I have a love of life. _____
25. I am too stable to kill myself. _____

26. I am a coward and do not have the guts to do it. _____
27. My religious beliefs forbid it. _____
28. The effect on my children would be harmful. _____
29. I am curious about what will happen in the future. _____
30. It would hurt my family too much and I would not want them to suffer. _____
31. I am concerned about what others would think of me. _____
32. I believe everything has a way of working out for the best. _____
33. I could not describe where, when and how to do it. _____
34. I consider it morally wrong. _____
35. I still have many things left to do. _____
36. I have the courage to face life. _____
37. I am happy and content with my life. _____
38. I am afraid of the actual act of killing myself (the pain, blood, violence). _____
39. I believe killing myself would not really accomplish or solve anything. _____
40. I hope that things will improve and the future will be happier. _____
41. Other people would think that I am weak and selfish. _____
42. I have an inner drive to survive. _____
43. I would not want other people to think I did not have control over my life. _____
44. I believe I can find a purpose in life, a reason to live.
45. I see no reason to hurry death along. _____
46. I am so inept that my method would not work. _____
47. I would not want my family to feel guilty afterwards. _____
48. I would not want my family to think I was selfish or a coward. _____

APPENDIX E

Mean scores and standard devations for each of the symptomatology measures

Table 7.
Mean scores and standard deviations for current and recovered self-mutilation participants and the control group for each of the symptomatology measures.

	Current SM		Recovered SM		Control	
SCL-90-R						
Somatization	67.70	(8.36)	60.80	(11.59)	53.50	(10.69)*
Obs. Compulsive	65.55	(8.02)	62.80	(12.03)	55.95	(10.89)*
Int. Sensitivity	67.95	(10.14)	63.72	(11.65)	56.76	(12.01)*
Depression	64.45	(9.70)	64.48	(11.23)	54.43	(11.38)***
Anxiety	62.95	(11.23)	61.80	(11.54)	53.38	(12.13)*
Hostility	60.90	(12.06)	57.00	(12.42)	54.79	(10.40)
Phobic Anxiety	63.75	(10.26)	58.88	(11.59)	50.48	(9.14)***
Paranoid Ideation	63.20	(13.80)	56.56	(13.13)	52.38	(10.35)*
Psychoticism	66.40	(11.89)	62.92	(12.34)	55.05	(9.67)**
GSI	67.75	(8.53)	63.56	(10.91)	55.07	(12.03)***
PST	64.50	(8.58)	62.32	(10.02)	53.62	(11.60)**
PSDI	66.95	(8.63)	59.88	(11.32)	53.27	(9.62)***
BHS	7.48	(5.28)	7.04	(5.38)	2.5	(1.90)***
BAI	14.95	(9.52)	13.84	(11.96)	61.55	(6.81)**
BDI	17.14	(11.50)	13.00	(10.02)	5.17	(5.61)***
STAI-T	50.19	(11.22)	47.28	(11.83)	37.24	(9.73)***
DES	19.42	(11.88)	16.33	(11.76)	11.03	(11.08)*
Recent Exp.	369.81	(211.75)	394.24	(215.63)	390.95	(251.77)
HDHQ						
Crit. of others	5.67	(2.54)	4.08	(2.55)	4.52	(2.62)
Self-criticism	6.24	(2.45)	5.76	(2.44)	3.71	(2.37)***
Guilt	3.00	(1.79)	2.48	(1.83)	1.02	(1.14)***
Urge to act out host.	6.43	(2.23)	5.04	(2.69)	4.07	(1.80)**
Paranoid host.	1.91	(1.10)	1.28	(1.86)	0.93	(1.26)
Total host.	23.10	(6.72)	18.48	(8.58)	14.21	(6.51)***
Direction of host.	1.14	(7.71)	3.04	(7.49)	-0.48	(5.77)
Eysenck Impulsiveness Questionnaire						
Venturesomeness	9.94	(3.86)	10.23	(4.53)	10.24	(3.56)
Impulsiveness	10.47	(4.54)	8.36	(4.72)	8.73	(5.42)
Empathy	14.71	(2.39)	14.86	(3.88)	12.73	(2.67)*
Impulsive Behs.	8.20	(3.36)	7.00	(3.21)	5.15	(3.81)*
RFL-48						
Surv. & coping	3.46	(1.21)	4.21	(0.87)	4.70	(0.77)***
Resp. to family	3.60	(1.49)	4.07	(1.48)	4.03	(1.16)
Child concerns	2.94	(2.04)	3.11	(2.11)	3.86	(1.90)
Fear of suicide	1.86	(0.69)	2.70	(1.14)	2.33	(1.01)*
Social disapproval	2.03	(1.08)	2.54	(1.54)	2.27	(1.11)
Moral objections	1.53	(0.73)	1.85	(1.35)	2.34	(1.24)*
MSSI	3.62	(8.44)	1.16	(3.59)	0.05	(0.22)*

* $p < .05$. ** $p < .001$***. $p < .0001$.

Table 8.
Mean scores and standard deviations for male and female self-mutilation participants for each of the symptomatology measures.

	Male SM		Female SM	
SCL-90-R				
Somatization	61.56	(10.89)	60.96	(9.89)
Obsessive-Compulsive	65.17	(8.10)	63.26	(11.81)
Interpersonal Sensitivity	66.83	(11.19)	64.78	(11.16)
Depression	66.67	(8.97)	63.00	(11.27)
Anxiety	62.61	(12.08)	62.11	(10.97)
Hostility	59.61	(14.08)	58.15	(11.16)
Phobic Anxiety	63.33	(12.32)	59.52	(10.29)
Paranoid Ideation	61.89	(13.84)	57.93	(13.62)
Psychoticism	64.72	(10.05)	64.30	(13.52)
GSI	66.72	(9.01)	64.56	(10.75)
PST	65.17	(9.43)	62.04	(9.29)
PSDI	62.56	(9.15)	63.33	(11.79)
BHS	6.53	(4.61)	7.74	(5.74)
BAI	12.26	(10.23)	15.81	(11.16)
BDI	11.63	(6.53)	17.19	(12.62)
STAI-T	45.37	(11.15)	50.89	(11.43)
DES	14.81	(7.73)	19.64	(13.71)
Schedule of Recent Exp.	354.58	(187.66)	403.15	(228.65)
HDHQ				
Criticism of others	5.16	(2.32)	4.56	(2.86)
Self-criticism	5.58	(2.04)	6.26	(2.67)
Guilt	2.32	(1.77)	3.00	(1.82)
Urge to act out hostility	6.11	(2.60)	5.37	(2.53)
Paranoid hostility	1.95	(2.17)	1.30	(1.46)
Total hostility score	20.95	(8.55)	20.33	(8.10)
Direction of hostility	-0.11	(6.09)	3.78	(8.18)
Eysenck Impulsiveness Questionnaire				
Venturesomeness	12.80	(2.46)	8.42	(4.12)**
Impulsiveness	9.87	(4.78)	8.92	(4.72)
Empathy	13.07	(3.37)	15.88	(2.77)*
Impulsive Behaviours Ques.	7.25	(3.70)	7.65	(3.13)
RFL-48				
Survival & coping beliefs	3.99	(0.83)	3.78	(1.27)
Responsibility to family	3.51	(1.51)	4.12	(1.44)
Child related concerns	2.84	(2.15)	3.17	(2.00)
Fear of suicide	2.10	(0.94)	2.48	(1.10)
Fear of social disapproval	2.16	(1.20)	2.42	(1.48)
Moral objections	1.55	(0.97)	1.82	(1.21)

* $p < .01$. ** $p < .001$.

Table 9.
Mean scores and standard deviations for frequent and infrequent self-mutilation participants and the control group for each of the symptomatology measures.

	Frequent SM		Infrequent SM		Control	
SCL-90-R						
Somatization	63.43	(9.92)	57.79	(8.64)	53.50	(10.69)**
Obs. Compulsive	66.04	(9.62)	60.57	(12.09)	55.95	(10.89)**
Int. Sensitivity	67.29	(10.40)	64.07	(12.88)	56.76	(12.01)*
Depression	67.07	(9.98)	60.50	(10.87)	54.43	(11.38)***
Anxiety	65.43	(10.30)	58.43	(11.30)	53.38	(12.13)**
Hostility	60.46	(12.08)	57.43	(12.95)	54.79	(10.40)
Phobic Anxiety	62.64	(10.84)	57.07	(12.09)	50.48	(9.14)***
Paranoid Ideation	62.00	(12.98)	54.93	(14.15)	52.38	(10.35)**
Psychoticism	67.00	(11.77)	60.43	(13.17)	55.05	(9.67)***
GSI	68.04	(9.08)	61.36	(11.32)	55.07	(12.03)***
PST	65.36	(8.31)	60.43	(11.15)	53.62	(11.60)***
PSDI	65.89	(10.15)	57.93	(10.44)	53.27	(9.62)***
BHS	8.79	(5.09)	4.71	(5.11)	2.5	(1.90)***
BAI	17.21	(12.07)	10.57	(5.72)	61.55	(6.81)***
BDI	17.79	(11.68)	10.14	(7.46)	5.17	(5.61)***
STAI-T	52.55	(10.32)	42.57	(11.35)	37.24	(9.73)***
DES	20.80	(13.29)	12.88	(5.73)	11.03	(11.08)*
Recent Exp.	397.97	(217.87)	364.57	(219.60)	390.95	(251.77)
HDHQ						
Crit. of others	5.14	(2.68)	4.07	(2.76)	4.52	(2.62)
Self-criticism	6.62	(2.50)	5.14	(1.92)	3.71	(2.37)***
Guilt	3.31	(1.65)	2.00	(1.66)	1.02	(1.14)***
Urge to act out host.	6.00	(2.73)	5.07	(2.37)	4.07	(1.80)*
Paranoid host.	1.55	(1.80)	1.79	(1.97)	0.93	(1.26)
Total host.	22.45	(8.06)	17.93	(8.27)	14.21	(6.51)***
Direction of host.	3.14	(7.82)	1.36	(7.43)	-0.48	(5.77)
Eysenck Impulsiveness Questionnaire						
Venturesomeness	8.76	(3.74)	12.17	(4.00)	10.24	(3.56)*
Impulsiveness	9.56	(4.98)	8.33	(4.05)	8.73	(5.42)
Empathy	15.44	(2.45)	14.00	(4.51)	12.73	(2.67)*
Impulsive Behs.	8.00	(3.30)	6.30	(3.06)	5.15	(3.81)*
RFL-48						
Surv. & coping	3.51	(1.18)	4.46	(0.71)	4.70	(0.77)***
Resp. to family	3.99	(1.55)	3.60	(1.49)	4.03	(1.16)
Child concerns	2.83	(2.04)	3.49	(2.21)	3.86	(1.90)
Fear of suicide	2.37	(1.02)	2.22	(1.22)	2.33	(1.01)
Social disapproval	2.02	(1.17)	2.74	(1.54)	2.27	(1.11)
Moral objections	1.74	(1.13)	1.79	(1.18)	2.34	(1.24)

* $p < .01$. ** $p < .001$. *** $p < .0001$

Table 10.
Mean scores and standard deviations for male and female self-mutilation and control participants for the Eysenck Impulsiveness Questionnaire.

	Ventruesomeness		Impulsiveness		Empathy	
Male SM	12.80	(2.46)	9.87	(4.78)	13.07	(3.37)
Female SM	8.42	(4.12)	9.92	(4.72)	15.88	(2.77)
Male Control	10.67	(4.20)	8.33	(5.09)	11.07	(2.31)
Female Control	10.00	(3.20)	8.96	(5.68)	13.69	(2.40)

APPENDIX F

Motivation for Self-mutilation Scale

A. Motivation for self-mutilation scale

I would like to look at the reasons why you injure yourself. The answer to the following questions could be **not at all, a little,** or **a great deal.**

Depression	Not at all	A little	A great deal
Did you want to die?	1	2	3
Did you feel that there was no hope?	1	2	3
Did you feel like a failure?	1	2	3
Did you feel that you had let others down?	1	2	3
Did you feel sad?	1	2	3
Extrapunitive			
Did you want to make someone sorry?	1	2	3
Did you feel angry?	1	2	3
Did you think "I'll show him/her"?	1	2	3
Did you think that it would upset someone?	1	2	3
Did you want to teach someone a lesson?	1	2	3
Alienation			
Did you feel lonely?	1	2	3
Did you feel that you weren't needed?	1	2	3
Did you feel that you'd been left out of things?	1	2	3
Did you feel that you'd been hurt?	1	2	3
Did you feel that someone wanted you out of the way?	1	2	3
Operant			
Did you want someone to be different towards you?	1	2	3
Did you hope that someone would change?	1	2	3
Did you feel it was the only way to make someone see what they were doing to you?	1	2	3
Did you feel it was a way of making others understand you?	1	2	3
Did you feel that you couldn't bear for someone to leave?	1	2	3
Modelling			
Did you think if others can do it so can I?	1	2	3
Has anyone in your family spoken about injuring themselves?	1	2	3
Did you know anyone else who injured themselves?	1	2	3

Did you hear about self-injury on TV, radio, or read about it in newspapers and magazines?	1	2	3
Did the fact that others do it affect you?	1	2	3
Avoidance			
Did you feel that you just had to get away from it all?	1	2	3
Did you feel you just wanted to die?	1	2	3
Did you feel you had to get away while things straightened themselves out?	1	2	3
Did you feel you couldn't put up with it much more?	1	2	3
Did you feel you wanted to leave it to others to sort out?	1	2	3
Tension reduction			
Did you feel so tense you had to do something?	1	2	3
Did you feel anxious and feel it was the only way of? coping?	1	2	3
Did everything seem not quite real before you did it?	1	2	3
Did it hurt as much as you thought it would?	1	2	3**
Did you feel less anxious after you had done it?	1	2	3
Janus face			
Did you feel you didn't really care if you lived or died?	1	2	3
Did you feel uncertain if you wanted to live or die?	1	2	3
Did you feel you would take a chance on whether you lived or died?	1	2	3
Did you feel that you wanted to live but also wanted to die?	1	2	3
Did you feel that it didn't matter if you lived or died?	1	2	3
Intropunitive			
Did you feel that you deserved to be punished?	1	2	3
Did you feel guilty?	1	2	3
Did you feel like you hated yourself?	1	2	3
Did you feel that you were a bad and worthless person?	1	2	3
Did you feel you had to punish yourself for something you had done?	1	2	3

**Scored in the opposite direction.

APPENDIX G

Mean scores and standard devations for the Motivation for Self-mutilation Scale

Table 11.
Mean scores and standard deviations for the total sample of self-mutilation participants for each subscale of the Motivation for Self-mutilation Scale.

Motivation subscale	M	SD
Depression	11.59	(2.27)
Extrapunitive	8.26	(2.27)
Alienation	10.80	(2.20)
Operant	8.00	(2.88)
Modelling	7.35	(2.00)
Avoidance	10.02	(2.81)
Tension Reduction	12.39	(2.23)
Janus Face	9.39	(3.03)
Intropunitive	10.60	(3.26)

Table 12.
Mean scores and standard deviations for the current and recovered self-mutilation groups for each subscale of the Motivation for Self-mutilation Scale.

SCALE	Current SM		Recovered SM	
	M	SD	M	SD
Motivation subscales				
Depression	11.24	(2.43)	11.88	(2.13)
Extrapunitive	8.24	(1.48)	8.28	(2.81)
Alienation	10.38	(2.04)	11.16	(2.30)
Operant	7.81	(2.56)	8.16	(3.16)
Modelling	7.14	(1.77)	7.52	(2.20)
Avoidance	9.71	(2.83)	10.28	(2.82)
Tension Reduction	12.48	(2.14)	12.32	(2.34)
Janus Face	8.76	(3.32)	9.92	(2.72)
Intropunitive	10.65	(3.57)	10.55	(3.02)

Table 13.
Mean scores and standard deviations for male and female self-mutilation participants for each subscale of the Motivation for Self-mutilation Scale.

Motivation subscale	Male		Female	
	M	SD	M	SD
Depression	10.74	(2.42)	12.19	(1.98)*
Extrapunitive	8.16	(1.92)	8.33	(2.53)
Alienation	10.53	(2.57)	11.00	(1.92)
Operant	9.75	(2.63)	8.04	(3.08)
Modelling	6.95	(1.68)	7.63	(2.19)
Avoidance	9.63	(2.83)	10.30	(2.81)
Tension Reduction	11.05	(2.39)	13.33	(1.54)**
Janus Face	9.00	(3.20)	9.67	(2.94)
Intropunitive	8.78	(3.04)	12.09	(2.67)**

* $p < .05$. ** $p < .001$.

Table 14.
Mean scores and standard deviations for the frequent and infrequent self-mutilation groups for each subscale of the Motivation for Self-mutilation Scale.

Motivation scale	Frequent SM		Infrequent SM	
	M	SD	M	SD
Depression	12.24	(1.94)	10.93	(2.43)
Extrapunitive	8.28	(2.54)	8.50	(1.95)
Alienation	11.07	(1.56)	10.71	(3.00)
Operant	7.93	(3.26)	8.21	(2.33)
Modelling	7.41	(2.10)	7.43	(1.95)
Avoidance	9.97	(2.71)	10.64	(3.08)
Tension Reduction	12.79	(2.30)	12.00	(1.80)
Janus Face	9.86	(2.96)	9.07	(3.05)
Intropunitive	11.79	(2.77)	9.38	(3.28)*

* $p < .05$.

APPENDIX H

Scales used in Study 4

A. The Betts QMI Vividness of Imagery Scale (Sheehan, 1967)

The aim of this test is to determine the vividness of your imagery. The items of the test will bring certain images to your mind. You are to rate the vividness of each image by reference to an accompanying rating scale, reproduced below and on top of the next page. For example, if your image is "vague and dim" you give it a rating of 5.

Before turning to items on the next pages, familiarise yourself with the different rating scale categories printed below and on top of the following page. Please do not leave any page until you have completed the items on the page you are doing, and do not go back to check on completed items. Complete each set before moving on to the next set. Try to do each item separately, independently of how you may have done other items.

The image aroused by an item of this test may be:

Perfectly clear and vivid as the actual experience.	Rating 1
Very clear and comparable in vividness to the actual experience.	Rating 2
Moderately clear and vivid.	Rating 3
Not clear or vivid, but recognisable.	Rating 4
Vague and dim.	Rating 5
So vague and dim as to be hardly discernible.	Rating 6
No image present at all, you only "know" that you are thinking of the object.	Rating 7

An example of an item on the test would be one which asked you to consider an image which comes to your mind's eye of a red apple. If your visual image was moderately clear and vivid you would check the rating scale and mark "3" on the prepared answer sheet. Now turn to the next page when you have understood these instructions and begin the test.

Here is the rating scale again in brief:

Perfectly clear and vivid:	**Rating 1**	**Vague and dim:**	**Rating 5**
Very clear:	**Rating 2**	**Hardly discernible:**	**Rating 6**
Moderately clear:	**Rating 3**	**No image at all:**	**Rating 7**
Recognisable:	**Rating 4**		

Think of some relative or friend whom you frequently see, considering carefully the picture that rises before your mind's eye. Classify the images suggested by each of the following questions as indicated by the degrees of clearness and vividness specified on the Rating Scale.

Item	Rating
1. The exact contour of the face, head, shoulders and body.....	( )
2. Characteristic poses of head, attitudes of body, etc.....	( )
3. The precise carriage, length of step, etc., in walking.....	( )
4. The different colours worn in some familiar costume.....	( )

Think of seeing the following, considering carefully the image which comes to your mind's eye; and classify the image suggested as indicated by the degree of clearness and vividness specified on the Rating Scale.

Item	Rating
5. The mood as it is sinking below the horizon.....	( )

Think of each of the following sounds, considering carefully the image which comes to your mind's ear, and classify the images suggested by each of the following questions as indicated by the degrees of clearness and vividness specified on the Rating Scale.

Item	Rating
6. The whistle of a locomotive.....	( )
7. The honk of an automobile.....	( )
8. The meowing of a cat.....	( )
9. The sound of escaping steam.....	( )
10. The clapping of hands in applause.....	( )

Think of "feeling" or touching each of the following, considering carefully the image which comes to your mind's touch, and classify the images suggested by each of the following questions as indicated by the degrees of clearness and vividness specified on the Rating Scale.

Item	Rating
11. Sand.....	( )
12. Linen.....	( )
13. Fur.....	( )
14. The prick of a pin.....	( )
15. The warmth of a tepid bath.....	( )

Think of performing each of the following acts, considering carefully the image which comes to your mind's arms, legs, lips, etc., and classify the images suggested as indicated by the degree of clearness and vividness specified on the Rating Scale.

Item	Rating
16. Running upstairs	( )
17. Springing across a gutter	( )
18. Drawing a circle on paper	( )
19. Reaching up to a high shelf	( )
20. Kicking something out of your way	( )

Think of tasting each of the following considering carefully the image which comes to your mind's mouth, and classify the images suggested by each of the following questions as indicated by the degrees of clearness and vividness specified on the Rating Scale.

Item	Rating
21. Salt	( )
22. Granulated (white) sugar	( )
23. Oranges	( )
24. Jelly	( )
25. Your favourite soup	( )

Think of smelling each of the following, considering carefully the image which comes to your mind's nose, and classify the images suggested by each of the following questions as indicated by the degrees of clearness and vividness specified of the Rating Scale.

Item	Rating
26. An ill-ventilated room	( )
27. Cooking cabbage	( )
28. Roast beef	( )
29. Fresh paint	( )
30. New leather	( )

Think of each of the following sensations, considering carefully the image which comes before your mind, and classify the images suggested as indicated by the degrees of clearness and vividness specified of the Rating Scale.

Item	Rating
31. Fatigue	( )
32. Hunger	( )
33. A sore throat	( )
34. Drowsiness	( )
35. Repletion as from a very full meal	( )

B. Gordon Test of Visual Imagery Control (Gordon, 1949)

You have just completed a questionnaire that was designed to measure the vividness of different kinds of imagery. In this present questionnaire some additional aspects of your imagery are being studied.

The questions are concerned with the ease with which you can control or manipulate visual images. For some people this task is relatively easy and for others relatively hard. One subject who could not manipulate his imagery easily gave this illustration. He visualised a table, one of whose legs suddenly began to collapse. He then tried to visualise another table with four solid legs, but found it impossible. The image of the first table with its collapsing leg persisted. Another subject reported that when he visualised a table the image was rather vague and dim. He could visualise it briefly but it was difficult to retain by any voluntary effort. In both these illustrations the subjects had difficulty in controlling or manipulating their visual imagery. It is perhaps important to emphasise that these experiences are in no way abnormal and are often reported as the controllable types of image.

Read each question, then close your eyes while you try to visualise the scene described. Each question is to be answered either Yes, No or Unsure, whichever is the more appropriate. Record your answers on the prepared answer sheet by rating Yes as 1, No as 2, and Unsure as 3.

Ratings: Yes = 1, No = 2, Unsure = 3

Item		Rating
1.	Can you see a car standing in the road in front of a house?	( )
2.	Can you see it in colour?	( )
3.	Can you now see it in a different colour?	( )
4.	Can you now see the same car lying upside down?	( )
5.	Can you now see the same car back on its four wheels again?	( )
6.	Can you see the car running along the road?	( )
7.	Can you see it climb a very steep hill?	( )
8.	Can you see it climb over the top?	( )
9.	Can you now see it get out of control and crash through a house?	( )
10.	Can you now see the same car running along the road with a handsome couple inside?	( )
11.	Can you see the car cross a bridge and fall over the side into the stream below?	( )
12.	Can you see the car old and dismantled in a care wrecking yard?	( )

C. Stimulus-Response Inventories for Anxiousness and Hostility (Endler et al., 1962)

Choose one of the five alternative degrees of reaction or attitude for each of the following items.

1. You are going to meet a new date.

Heart beats faster	Not at all	1	2	3	4	5	Much faster
Perspire	Not at all	1	2	3	4	5	Perspire much
Need to urinate frequently	Not at all	1	2	3	4	5	Very much
Mouth gets dry	Not at all	1	2	3	4	5	Very dry
Have loose bowels	Not at all	1	2	3	4	5	Very much
Experience nausea	Not at all	1	2	3	4	5	Much nausea

2. You are crawling along a ledge high on a mountain side.

Heart beats faster	Not at all	1	2	3	4	5	Much faster
Perspire	Not at all	1	2	3	4	5	Perspire much
Need to urinate frequently	Not at all	1	2	3	4	5	Very much
Mouth gets dry	Not at all	1	2	3	4	5	Very dry
Have loose bowels	Not at all	1	2	3	4	5	Very much
Experience nausea	Not at all	1	2	3	4	5	Much nausea

3. You are getting up to give a speech before a large group.

Heart beats faster	Not at all	1	2	3	4	5	Much faster
Perspire	Not at all	1	2	3	4	5	Perspire much
Need to urinate frequently	Not at all	1	2	3	4	5	Very much
Mouth gets dry	Not at all	1	2	3	4	5	Very dry
Have loose bowels	Not at all	1	2	3	4	5	Very much
Experience nausea	Not at all	1	2	3	4	5	Much nausea

4. You are going to talk to someone to seek help in solving a personal problem.

Heart beats faster	Not at all	1	2	3	4	5	Much faster
Perspire	Not at all	1	2	3	4	5	Perspire much
Need to urinate frequently	Not at all	1	2	3	4	5	Very much
Mouth gets dry	Not at all	1	2	3	4	5	Very dry
Have loose bowels	Not at all	1	2	3	4	5	Very much
Experience nausea	Not at all	1	2	3	4	5	Much nausea

5. You are going to an interview for a very important job.

Heart beats faster	Not at all	1	2	3	4	5	Much faster
Perspire	Not at all	1	2	3	4	5	Perspire much
Need to urinate frequently	Not at all	1	2	3	4	5	Very much
Mouth gets dry	Not at all	1	2	3	4	5	Very dry
Have loose bowels	Not at all	1	2	3	4	5	Very much
Experience nausea	Not at all	1	2	3	4	5	Much nausea

6. You are talking to someone and she or she does not answer.

Heart beats faster	Not at all	1	2	3	4	5	Much faster
Perspire	Not at all	1	2	3	4	5	Perspire much
Muscles become tense	Not at all	1	2	3	4	5	Very tense
Mouth gets dry	Not at all	1	2	3	4	5	Very dry
Breathing becomes rapid	Not at all	1	2	3	4	5	Very rapid
Hands become sweaty	Not at all	1	2	3	4	5	Very sweaty

7. Someone has lost an important book of yours.

Heart beats faster	Not at all	1	2	3	4	5	Much faster
Perspire	Not at all	1	2	3	4	5	Perspire much
Muscles become tense	Not at all	1	2	3	4	5	Very tense
Mouth gets dry	Not at all	1	2	3	4	5	Very dry
Breathing becomes rapid	Not at all	1	2	3	4	5	Very rapid
Hands become sweaty	Not at all	1	2	3	4	5	Very sweaty

8. You have just found out that someone has told lies about you.

Heart beats faster	Not at all	1	2	3	4	5	Much faster
Perspire	Not at all	1	2	3	4	5	Perspire much
Muscles become tense	Not at all	1	2	3	4	5	Very tense
Mouth gets dry	Not at all	1	2	3	4	5	Very dry
Breathing becomes rapid	Not at all	1	2	3	4	5	Very rapid
Hands become sweaty	Not at all	1	2	3	4	5	Very sweaty

9. You arrange to meet someone and he or she doesn't show up.

Heart beats faster	Not at all	1	2	3	4	5	Much faster
Perspire	Not at all	1	2	3	4	5	Perspire much
Muscles become tense	Not at all	1	2	3	4	5	Very tense
Mouth gets dry	Not at all	1	2	3	4	5	Very dry
Breathing becomes rapid	Not at all	1	2	3	4	5	Very rapid
Hands become sweaty	Not at all	1	2	3	4	5	Very sweaty

10. You are carrying a cup of coffee to the table and someone bumps into you.

Heart beats faster	Not at all	1	2	3	4	5	Much faster
Perspire	Not at all	1	2	3	4	5	Perspire much
Muscles become tense	Not at all	1	2	3	4	5	Very tense
Mouth gets dry	Not at all	1	2	3	4	5	Very dry
Breathing becomes rapid	Not at all	1	2	3	4	5	Very rapid
Hands become sweaty	Not at all	1	2	3	4	5	Very sweaty

D. Visual Analogue Scales (McCormack et al., 1988)

Script type_____

Script stage_____

How did you feel: Relaxed |_____| Tense

How did you feel: Relaxed |_____| Anxious

How did you feel: Calm |_____| Angry

How did you feel: Unafraid |_____| Afraid

How did you feel: Happy |_____| Sad

How did you feel: Normal |_____| Unreal

How did you feel: Relieved |_____| Uptight

How well were you able to picture yourself in that scene: Unclear |_____| Clear

How close to real life was that scene: Not close |_____| Very close

APPENDIX I

Examples of imagery scripts

A. Self-mutilation

1. Setting the scene

Right, I want you to imagine that you are in your bedroom at home. Really put yourself there now. You are sitting on sitting on your bed thinking about the fight that you had with your boyfriend. Look around the room. See the big wardrobes over to your left. Notice the gold handles on the white doors of the wardrobes now. Look down at the bed that you are sitting on. Really picture the colourful Ken Done doona cover that you have on your bed. Feel the bed beneath you as you sit there thinking about the fight. Look over to the window on the other side of your room. Look out the window. You said that you can see the next door neighbours yard from your room. *Concentrate on that image right now (pause).* Notice the white curtains that are hanging over the window. Really see the little flower pattern there on your curtains. Look over to your chest of drawers now. Really see them there in front of your, opposite your bed. See the painted eggs that you have sitting on top of your chest of drawers. You said you were sitting on your bed staring off into space. You said that you were feeling pretty upset and uptight as you sat there on your bed going over and over in your mind about the fight that you had with your boyfriend today. Remember how uptight and upset you were feeling now as you think about the fight that you had with your boyfriend. *Concentrate on that feeling right now (pause).* Now open your eyes and switch that scene off.

2. Approach

Right, you are sitting on your bed in your room at home thinking about the fight that you had with your boyfriend. Really put yourself there now. You said you were feeling upset and uptight. You said that you were thinking about how tired you are with fighting with him. You are sitting there thinking that you knew what you had to do to make yourself feel better. Stand up now. Move over to the set of drawers. Reach out and open the drawers now. Feel the drawer slide out. See your little velvet pouch there in the front of the top drawer. Remember how you were feeling as you look at the little blue pouch. Reach in and pick up the velvet pouch where you keep your razor blades. Now push the draw closed. Pull a couple of tissues from the box that is on top of the drawer. You said you were feeling a bit spaced out as you were getting ready to cut yourself. *Concentrate on that feeling right now (pause).* Sit back down on the bed now. You have the velvet pouch and some tissues in your hand. Lay the tissues out on your bed. See them lying on top of the colourful doona cover now. Now pull the pouch open. Reach in and pull out two razor blades. Put the pouch down on the bed. now put the blades down on the bed. Look at them now. One is getting a bit old. You said that you were feeling a bit spaced out as you looked at the razor blades, trying to decide which one to use. Notice that one of the blades is looking old and blunt. Pick up the sharper blade. You are holding the blade in your hand now and you are sitting on the bed ready to cut yourself. You said that you were feeling spaced out and uptight as you prepared to cut yourself. *Concentrate on that feeling right now (pause).* Now open your eyes and switch that scene off.

3. Incident

Right, you are sitting on your bed with your razor blade in your hand. Really put yourself there now. You are ready to cut yourself. Pull up your left sleeve. Reach down with the blade and cut lengthways down your arm. Feel the blade slicing through your skin now. You said that it didn't hurt but you could feel the skin opening up. See the thin line of blood beginning to bead in the cut. Now take the razor and slice a line down the other side. See the v-shape that you have made on your arm now. See the red lines of blood that you have made. Remember how you felt as you began cutting your arm. You said that the blade felt really light in your hand. You said that you weren't thinking about anything but the cuts. *Concentrate*

on that feeling right now (pause). Now cut slowly down the middle of the two cuts. Feel the skin opening up as you drag the blade down your arm. You said that you were really getting into it now. You said that you have cut through the top layer of skin and you are scooping out the middle now. You are absorbed in making lots of little cuts down the middle. Picture yourself sitting on your bed cutting your arm. It looks like you have gotten rid of all the skin now. You said that it wasn't hurting. You said that it felt nice to drag the blade down the length of your arm without it catching on any skin. You said that you were absorbed in what you were doing and that you weren't thinking about anything else any more. *Concentrate on that image right now (pause).* Now open your eyes and switch that scene off.

4. Consequence

Right you are sitting on your bed cutting your arm. Really put yourself there now. See the thick line of blood that is running freely from the cuts in your arm now. You decide to stop cutting. Put the razor blade down on one of the tissues. Pick up the other tissue. Move your arm around so that the blood starts to trickle over your skin. You are absorbed in watching the blood run from the cut. Dab the blood that is trickling from the cut so that it doesn't drip on the floor. You said that it wasn't hurting and that it felt good to sit and watch the blood run. You said that you were feeling exhausted after cutting your arm, but nice and relaxed. You said that you thought that you would be able to sleep now. *Concentrate on that feeling right now (pause).* You said that you weren't thinking about anything any more, that you were just sitting there on your bed, watching your arm bleed. Feel the blood trickling down you arm now. You said you were feeling really tired, ready to drift off to sleep. Wipe your blade clean on the tissue. Now put your blade away in the pouch. Put your blades under the bed and lie down. You are lying on top of your bed now. You are holding your arm down so that you don't get blood on the bed. You said you were feeling relaxed and tired after cutting yourself and that you were ready to drift off to sleep. *Concentrate on that feeling right now (pause).* Now open your eyes and switch that scene off.

B. Accidental Injury

1. Setting the scene

Right, I want you to imagine that you are in the kitchen at your house. Really put yourself there now. You are standing at the bench in the kitchen preparing the vegies for tea. See the yellow shade of the laminex bench in front of you. You have the light coloured wooden chopping board there on the bench. See the vegies that you have placed on the bench now. You have a bag of carrots. Notice the condensation on the plastic carrot bag now. The bag is open and there are only a few carrots left. See the bag of potatoes over to your left. Notice the dirt on the potatoes now. Notice the green broccoli there near the potatoes now. You said that you were feeling quite relaxed as you prepared to fix the vegies for tea. *Concentrate on that feeling right now (pause).* Look over to your right now. See the wooden knife block there on top of the bench. Notice the black handles of the knives poking out of the knife block. Reach over with your right hand and grab hold of the big knife. Feel the shape of the handle in your hand now. You said that it felt quite smooth. Lift the knife out of the knife block now. Feel the knife slide out of its casing. See the shiny silver coloured blade of the knife now. Notice the serrated edge of the knife as you put it down on the chopping board. You said that you weren't thinking about anything in particular and that you could hear the sound of the television coming from the other room. You are feeling alright as you prepare the things for tea. *Concentrate on that feeling right now (pause).* Now open your eyes and switch that scene off.

2. Approach

Right, I want you to imagine that you are in the kitchen at your place. Really put yourself there now. You are standing at the bench and you have the vegies out ready. You are about to prepare tea. Reach over to the bag of carrot now. Pick a carrot out of the bag. Feel the shape of the carrot in your hand. Feel how cold the carrot is as it has been in the fridge. Lean over to the sink now. Reach out and turn on the cold water tap. Feel the shape of the tap in your hand. Hear the sound of the water starting to run out of the tap now. Hold the carrot under the cold water and give it a bit of a rinse. Feel how cold the water is on your hand now. Now turn the tap off. Give the carrot a shake and move back over to the chopping board. Put the carrot down on the board now. You aren't really thinking about anything in particular as you put the carrot down on the chopping board. *Concentrate on that image right now (pause).* Pick up the knife. Feel the weight of the knife in your hand now. You said that it was quite heavy. Hold the carrot with your left hand. You are going to cut the ends first. Hold the small end of the carrot under the blade of the knife. Now push the knife done. Feel the blade slicing through the end of the carrot with ease. See the little end piece of carrot fall away now. Now turn the carrot around. Put the large end of the carrot under the knife. Now push the knife down and chop the top of the carrot. Really feel the blade of the knife slicing through the carrot now. You said that you were feeling pretty relaxed as you prepared to cut the carrot into rings. Turn the carrot around again. You are holding it steady with your left hand as you begin to slice with your right. *Concentrate on that image right now (pause).* Now open your eyes and switch that scene off.

3. Incident

Right, you are standing at the bench in the kitchen at your place cutting up a carrot for tea. Really picture yourself there now. You are chopping fairly quickly. You said that you weren't really paying attention. You said that you were listening to the t.v in the other room as you chopped. Feel the pressure you are putting on the knife as you push the blade down through the carrot. Now feel the carrot slip. You said that your hand slipped and your finger got in the way of the blade. Feel the blade of the knife slicing through the top of your left index finger now. You said that you could feel it sting. Feel what it was like now. Drop the knife onto the board. See the blood welling up along your finger. You said that you started to feel a bit sick in the stomach when you saw the blood. *Concentrate on that feeling right now (pause).* Grab hold of your bleeding finger with your right hand. You are squeezing it tightly now. Feel how cold your fact is. You said that you could feel yourself go pale. You said that you knew that you had cut your finger pretty deeply and you didn't want to look at it. Feel the sticky blood in your hand. You know that you have to see how bad it is. Take your hand away now. You said that you could feel your heart beating hard in your chest as you took your hand away to look at your finger. See the flap of skin that has been cut away by the knife. It doesn't look too deep but you can feel the air in the cut skin. You said that felt really awful. Move your finger a bit know. See the blood welling in the cut again as you move your finger. You said that you weren't feeling very well as you stood there looking at the cut on your finger. *Concentrate on that feeling right now (pause).* Now open your eyes and switch that scene off.

4. Consequence

Right, you are standing there at the bench in the kitchen looking at your cut finger. Really put yourself there now. You are feeling a little bit sick as you look at the flap of skin you have cut on your finger. You said that you were thinking that it wasn't too deep and that you needed to get it cleaned up. Move over to the sink now. Reach out and turn on the cold water tap. You said that you could feel yourself tense up as you put your finger under the water. See the water washing over the cut in your finger now. See the red blood washing down into the silver coloured sink. Feel the

water stinging the cut now. You said that you could feel the water running under the lose flap of skin. You said that you weren't feeling sick any more but that your finger was starting to throb as you held it under the water. *Concentrate on that feeling right now (pause).* Turn off the tap. You can see that the cut isn't too deep and you are thinking about getting yourself a bandaid so that you can get on with the cooking. Reach down to the cupboard under the sink and open the door. See the paper towel that is handing inside the door. Tear yourself off a few pieces of paper towel and wrap it around your bleeding finger. Now squeeze your finger tightly with your other hand. You can see the blood starting to seep through the towel. You said that you were feeling annoyed with yourself for being so careless as you cleaned your finger up after cutting yourself with the knife. Your finger is throbbing a bit and you are feeling irritated with yourself. *Concentrate on that feeling right now (pause).* Now open your eyes and switch that scene off.

C. Anger

1. Setting the scene

Right, I want you to imagine that you are in the lounge room at your place. Really put yourself there now. You are sitting in the arm chair with your legs crossed. Picture yourself sitting there now watching television. It is 10 to 8 on a Saturday night and you are ready to go out. You said that your boyfriend was coming round to pick you up at 8. You said that you wouldn't be suprised if he was a few minutes late as he isn't very good at being on time. You said that you were looking forward to going out for dinner. You said that you were feeling pretty relaxed as you sat the arm chair watching t.v. *Concentrate on that feeling right now (pause).* Look around you now. You can see the large, black television in front of you. See the video recorder sitting in a shelf underneath the television stand. Notice the carpet on the floor now. It is orange and red and brown. You said that you were thinking about how horrible the carpet usually is in rental houses. Look behind the t.v now. You can see the mantelpiece with your C.Ds all stacked up along the shelf. Really picture yourself now, sitting in the arm chair watching the t.v as you wait for your boyfriend to arrive. You said that you were feeling pretty relaxed and you were looking forward to a night out. *Concentrate on that feeling right now (pause).* Now open your eyes and switch that scene off.

2. Approach

Right, I want you to imagine that you are sitting at home waiting for your boyfriend to come and pick up. Really put yourself there now. It is Saturday night and you are going out for dinner. Look down at your watch. Notice that it is just on 8 o'clock. Your boyfriend isn't here yet but you said that didn't really suprise. He is usually a little bit late. Notice that the show you were watching has finished now. Another show is starting. It is just after 8 now and you said that you were starting to feel a little annoyed. You don't really expect him to turn up for another 5 minutes or so but you like to be on time and it annoys you when people keep you waiting. *Concentrate on that feeling right now (pause).* Look down at your watch again now. Notice that it is a quarter past eight. Now he is really late. You said that you could feel yourself getting red in the face when you saw how late he was. You said that you were thinking how rude it is of him to be late like this. You said that you were starting to feel agitated. You said that you were jiggling your legs as you sat there in the chair. Stand up now. You aren't interested in the t.v any more and you are pacing around the lounge room. You are feeling annoyed at being kept waiting like this. You have been ready to go for ages and you were really looking forward to a nice night out. *Concentrate on that image right now (pause).* Now open your eyes and switch that scene off.

3. Incident

Right, it is Saturday night and you are pacing around your lounge room waiting for your boyfriend to turn up. Really picture yourself there now. Look down at your watch again. See that it is now twenty to nine. You can't believe that he is 40 minutes late! You said that you were starting to feel really worked up now. You said that your heart was pounding and you were feeling really agitated. Really remember what it was like now. You said that you were starting to wonder if he was going to turn up at all. You said that you were beginning to think that he had stood you up. Feel how upset you are getting as you think that he has dumped you. *Concentrate on that feeling right now (pause).* You are really pacing around the room now. You said that you were feeling really jittery and uptight and upset. You are thinking about really giving him a piece of your mind when he turns up. You can't believe he has kept you waiting this long. You said that you were getting more and more angry the later it got. You said that you felt like throwing something. Really remember what that was like now. You said that you were standing in the middle of the lounge room getting angrier and angrier because your boyfriend was so late. *Concentrate on that feeling right now (pause).* Now open your eyes and switch that scene off.

4. Consequence

Right, I want you to imagine that you are standing in the lounge room at your place. Really put yourself there now. Your boyfriend is over 40 minutes late to pick you up. You said that you were feeling really angry with him and a bit upset and panicky about why he is so late. You said that you were feeling agitated and hot and angry. Really remember what that was like now. Hear the sound of the doorbell ring. You said that it made you jump. Feel your heart pounding in your chest now. You said that your heart was beating really hard as you walked down the hallway to answer the door. You are feeling red and hot in the face as you reach out to open the door. *Concentrate on that feeling right now (pause).* Pull the door open now. See your boyfriend standing there on the door step. Hear the sound of his voice as he says 'you ready?' You said that he had a really arrogant, smug type of look on his face. Really remember what he looked like now. Reach inside and grab your coat. You said that you were thinking that you should really give him a piece of your mind and rip into him for being so late. It makes you even more angry that he hasn't even apologised. Step outside and pull the door shut hard behind. Hear the sound of it slam. You are thinking that there isn't any point in making an argument about this but you said that you were still feeling upset and angry about what has happened. *Concentrate on that feeling right now (pause).* Now open your eyes and switch that scene off.

D. Neutral

1. Setting the scene

Right, I want you to imagine that you are in the kitchen at your place. Really put yourself there now. It is fairly early in the morning. You have just gotten out of bed and you have come into the kitchen to make yourself a cup of tea. You are standing at bench. Notice the L shape of the bench that goes around the corner to the sink. Really notice the pale yellow colour of the bench top now. Turn around to your right. See the sink there in front of you now. Notice the silver colour of the sink and the clean dishes that are piled up on the draining tray on the right of the sink. You said that you were feeling alright, but a little bit tired as you came into the kitchen to make your first cup of tea for the day. *Concentrate on that feeling right now (pause).* Look up above the sink and out the window. You can see out into the back yard. Notice how frosty it looks outside. You said that you were feeling glad to be inside

where it is warm. Notice the light blue colour of the curtains that are pulled to the side of the window. You have just gotten out of bed and you said that you were feeling relaxed and ready for your first cup of tea for the day. You said that you were thinking about the day ahead as you prepared to make yourself a cup of tea. *Concentrate on that image right now (pause).* Now open your eyes and switch that scene off.

2. Approach

Right, you are standing at the bench in the kitchen at your place. Really put yourself there now. It is fairly early in the morning and you have come into the kitchen to make yourself a cup of tea. See the kettle sitting there on the bench in front of you. Really picture the white upright kettle there now. Notice the viewer window on the side of the kettle with the red ball inside that tells you how much water there is in the kettle. Notice that the red ball is close to the bottom of the window. *Concentrate on that image right now (pause).* Reach out with your right hand and pick up the kettle. Feel how light it is in your hand. Now turn around and hold the kettle underneath the cold tap in the sink. Reach out with your left hand and turn on the tap. Feel the shape of the tap in your hand now. You said that the tap had been turned off quite tightly. Feel the tap turn now and hear the sound of the water gushing into the kettle. Feel the weight of the kettle increase as it fills up with water. You said that you weren't thinking about anything in particular as you stood there at the sink with the kettle. Look at the indicator now. Notice that there is enough water for 2 cups. Turn the tap off and take the kettle back over to the bench. *Concentrate on that image right now (pause).* Now open your eyes and switch that scene off.

3. Incident

Right, I want you to picture yourself putting the kettle down on its base. Feel the kettle slot into its now. See the red switch that is at the base of the kettle near the plug. Push the red switch down now. Hear the click sound of the switch as you turn the kettle on. Now look up to the shelf above you. See the cups sitting there on the shelf. Reach up and grab your favourite. Feel the smooth texture of the cup in your hand. Now put it down on the bench. Picture the blue cup with the picture of the cat on the bench in front of you now. Notice the containers that are lined up against the wall on the bench behind your cup. Reach over and pick up the green container with the orange lid. Peel the lid off the container and put it down on the bench. *Concentrate on that image right now (pause).* Reach into the container and pull out a tea bag. Notice the blue tag on the tea bag now. Put the container down on the bench, pick up the lid and push it back on the container. Now put the container back where it belongs. Pull up the tag on the tea bag. Now put the tea bag in your cup. Make sure the tag is hanging over the side of the cup now. Hear the sound of the kettle starting to boil. Really hear the water bubbling. See the steam coming from the spout of the kettle. Now hear the kettle click itself off and the bubbling subside. You said that you were looking forward to your cup of tea. *Concentrate on that feeling right now (pause).* Now open your eyes and switch that scene off.

4. Consequence

Right, the kettle has just boiled and you are ready to make your cup of tea. Really picture yourself there now. Reach out and pick up the kettle. Feel the weight of it in your hand now. Tip the kettle up and pour the hot water into your cup. Feel the heat from the steam as you pour the water. See the level of the water rising in the cup. Notice the way the tea bag floats to the top of the water now. Your cup is nearly full now. Put the kettle back down in its base. Now pick up the tea bag tag and give it a bit of a jiggle. You said that you could smell the tea as you stood there jiggling the tea bag. *Concentrate on that image right now (pause).* Notice how strong and brown

your tea looks now. Pull the tea bag out of the cup now. Notice the water dripping from the bottom of the tea bag as you hold it over the cup. Squeeze the tea bag quickly between your fingers. Feel how hot the tea bag is now. Now hold the tea bag over the palm of your hand and move over to the bin. Push the foot pedal for the bin and see the lid pop up. Now drop the tea bag in the bin. Take your foot off the pedal and hear the sound of the lid drop down. Now move back over to the bench and pick up your cup of tea. You said that you were feeling relaxed and looking forward to sitting down with your first cup of tea for the day. *Concentrate on that image right now (pause).* Now open your eyes and switch that scene off.

APPENDIX J

Mean scores and standard deviations for the S-R Inventory and description of between group differences

Table 15.
Means and standard deviations for the S-R Inventory for Anxiousness and Hostility for current and recovered self-mutilation participants and the control group.

S-R Inventory	Current SM		Recovered SM		Control	
	M	SD	M	SD	M	SD
Anxiousness						
Total Anxiety	70.40	(18.60)	74.71	(20.74)	63.38	(16.74)
Heart rate	3.94	(2.27)	3.63	(0.81)	3.56	(0.77)
Perspiration	3.20	(3.00)	2.97	(1.14)	2.53	(0.80)
Urinary frequency	2.25	(1.15)	2.08	(1.00)	1.57	(0.63) *
Dry mouth	2.90	(1.15)	2.38	(1.07)	2.11	(0.96) *
Loose bowels	1.71	(1.24)	1.81	(0.87)	1.27	(0.44) *
Nausea	1.98	(0.98)	2.03	(0.98)	1.71	(0.84)
Hostility						
Total Hostility	61.60	(23.64)	60.04	(25.46)	52.58	(21.14)
Heart rate	2.73	(1.29)	2.64	(1.10)	2.29	(1.02)
Perspiration	2.03	(1.90)	2.01	(1.09)	1.48	(0.64)
Muscle tension	3.19	(2.31)	2.59	(1.15)	2.30	(1.13)
Dry mouth	1.91	(1.26)	1.53	(0.80)	1.42	(0.67)
Rapid breathing	2.15	(1.03)	1.96	(0.97)	1.72	(0.84)
Hand sweatiness	2.40	(2.50)	1.62	(0.93)	1.51	(0.70)

*$p < .05$.

Table 16.
Means and standard deviations for the S-R Inventory for Anxiousness and Hostility for male and female self-mutilation and control participants.

S-R Inventory	Female SM		Male SM		Female control		Male control	
	M	SD	M	SD	M	SD	M	SD
Anxiousness								
Total Anxiety	77.67	(17.67)	68.00	(19.95)	65.64	(16.89)	59.60	(16.35) *
Heart rate	3.63	(0.76)	4.19	(2.57)	3.61	(0.75)	3.47	(0.80)
Perspiration	2.85	(1.08)	3.73	(3.33)	2.57	(0.84)	2.45	(0.76)
Urinary freq.	2.23	(0.92)	2.09	(1.35)	1.56	(0.63)	1.59	(0.64) *
Dry mouth	2.70	(1.10)	2.68	(1.11)	2.38	(1.02)	1.67	(0.64) *
Loose bowels	1.94	(1.05)	1.55	(1.04)	1.22	(0.37)	1.35	(0.53) *
Nausea	2.14	(0.93)	1.91	(1.04)	1.81	(0.93)	1.53	(0.67)

(table continues)

Table 16. *(continued)*

Hostility								
Total Host.	58.70	(22.76)	68.00	(26.40)	53.44	(21.51)	51.13	(21.18)
Heart rate	2.55	(1.02)	3.04	(1.43)	2.38	(1.13)	2.12	(0.83)
Perspiration	1.77	(1.04)	2.60	(2.05)	1.45	(0.56)	1.53	(0.77)*
Muscle tension	2.71	(1.04)	3.39	(2.62)	2.35	(1.16)	2.20	(1.12)
Dry mouth	1.56	(1.01)	2.03	(1.08)	1.50	(0.77)	1.28	(0.44)
Rapid breath.	1.97	(0.90)	2.32	(1.12)	1.75	(0.90)	1.65	(0.77)
Hand sweat.	1.57	(0.90)	2.83	(2.77)	1.43	(0.59)	1.63	(0.86)*

*$p < .05$.

Table 17.
Means and standard deviations for the S-R Inventory for Anxiousness and Hostility for frequent and infrequent self-mutilation participants and the control group.

S-R Inventory	Frequent SM		Infrequent SM		Control	
	M	SD	M	SD	M	SD
Anxiousness						
Total Anxiety	77.89	(19.15)	66.86	(16.76)	63.38	(16.74)*
Heart rate	4.02	(1.92)	3.44	(0.77)	3.56	(0.77)
Perspiration	3.42	(2.53)	2.66	(1.06)	2.53	(0.80)
Urinary frequency	2.24	(1.16)	2.06	(0.92)	1.57	(0.63)*
Dry mouth	3.00	(1.09)	2.09	(0.83)	2.11	(0.96)**
Loose bowels	1.97	(1.17)	1.46	(0.66)	1.27	(0.44)*
Nausea	2.21	(1.04)	1.74	(0.73)	1.71	(0.84)
Hostility						
Total Hostility	64.29	(25.44)	57.50	(21.74)	52.58	(21.14)
Heart rate	2.84	(1.34)	2.49	(0.78)	2.29	(1.02)
Perspiration	2.11	(1.67)	1.99	(1.16)	1.48	(0.64)
Muscle tension	3.24	(2.01)	2.37	(0.99)	2.30	(1.13)*
Dry mouth	1.83	(1.20)	1.56	(0.67)	1.42	(0.67)
Rapid breathing	2.29	(1.05)	1.70	(0.72)	1.72	(0.84)*
Hand sweatiness	2.17	(2.21)	1.71	(0.89)	1.51	(0.70)

*$p < .05$.

A. Between group differences for the S-R Inventory

S-R Inventory for current and recovered self-mutilation groups

Significant differences between current and recovered self-mutilation and control groups were demonstrated for the S-R Inventory for Anxiousness for urinary frequency, F (2, 83) = 4.87, $p < .01$, dry mouth, F (2, 83) = 3.88, $p < .05$, and bowel movement, F (2, 83) = 4.04, $p < .05$.

Post hoc analyses indicated that current self-mutilation participants reported significantly higher levels of urinary frequency (Fisher LSD = 0.48, $p < .05$), bowel disturbance (Fisher LSD = 0.44, $p < .05$) and dryness of mouth (Fisher LSD = 0.56, $p< .05$) related to anxiousness than control participants. Recovered self-mutilation participants reported significantly higher levels of urinary frequency (Fisher LSD = 0.45, $p < .05$) and bowel disturbance (Fisher LSD = 0.42, $p < .05$) than the control group in response to anxiousness.

No significant differences between the current, recovered and control groups for any of the response measures for the S-R Inventory for Hostility were demonstrated.

Sex differences for S-R Inventory

Significant differences between male and female self-mutilation and control participants were noted for the S-R Inventory for Anxiousness for the total anxiety score, F (3, 81) = 3.89, $p < .05$; urinary frequency, F (3, 81) = 3.26, $p < .05$; dry mouth, F (3, 81) = 3.84, $p < .05$; and bowel movement, F (3, 81) = 2.53, $p < .05$.

Female self-mutilation participants demonstrated significantly higher total anxiety scores that female control (Fisher LSD = 9.77, $p < .05$) and male control participants (Fisher LSD = 11.33, $p < .05$). In addition, the female self-mutilation group reported significantly higher levels of urinary frequency than female control (Fisher LSD = 0.49, $p < .05$) and male control groups (Fisher LSD = 0.57, $p < .05$). Male control participants reported a dry mouth in response to anxiety to a significantly lower degree than female self-mutilation (Fisher LSD = 0.65, $p < .05$), male self-mutilation (Fisher LSD = 0.73, $p < .05$), and female control groups (Fisher LSD = 0.66, $p < .05$). The female self-mutilation group reported significantly higher levels of bowel disturbance than female control (Fisher LSD = 0.45, $p < .05$) and male control groups (Fisher LSD = 0.52, $p < .05$).

Significant differences between male and female self-mutilation and control participants was noted for the perspiration, F (3, 81) = 4.56, $p < .05$; and skin sweatiness subscales of the S-R Inventory for Hostility, F (3, 81) = 3.71, $p < .05$. For the Hostility scale, post hoc analyses indicated that for perspiration, male self-mutilation participants scored significantly higher than female self-mutilation (Fisher LSD = 0.74, $p < .05$), female control (Fisher LSD = 0.75, $p < .05$) and male control groups (Fisher LSD = 0.83, $p < .05$). In addition, male self-mutilation participants scored significantly higher than female self-mutilation (Fisher LSD = 0.88, $p < .05$), female control (Fisher LSD = 0.89, $p < .05$) and male control groups (Fisher LSD = 1.00, $p < .05$) for skin sweatiness.

S-R Inventory for frequent and infrequent self-mutilation groups

Significant differences between frequent and infrequent self-mutilation participants and the control group were evident for the S-R Inventory for Anxiousness for the total anxiety score, F (2, 81) = 5.72, $p < .01$; urinary frequency, F (2, 81) = 3.986, $p < .01$; dry mouth, F (2, 81) = 7.41, $p < .001$; and bowel movement, F (2, 81) = 4.20, $p < .01$.

Post hoc analyses demonstrated that the frequent self-mutilation group scored significantly higher than the control group for total anxiety (Fisher LSD = 8.63, $p <$ .05), urinary frequency (Fisher LSD = 0.44, $p< .05$), dry mouth (Fisher LSD = 0.48. $p <$ .05), and bowel movement (Fisher LSD = 0.39, $p < .05$). In addition, the frequent self-mutilation group scored significantly higher than the infrequent self-mutilation participants for dry mouth (Fisher LSD = 0.64, $p< .05$).

For the Hostility scale, significant differences between frequent and infrequent self-mutilation participants and the control group were noted for muscle tension, F (2, 81) = 7.97, $p< .05$; and rapid breathing, F (2, 81) = 3.83, $p< .05$. Post hoc analyses indicated that the frequent self-mutilation group scored significantly higher than control participants for both muscle tension (Fisher LSD = 0.72, $p < .05$) and rapid breathing (Fisher LSD = 0.44, $p < .05$). In addition, frequent self-mutilation participants scored significant higher than the infrequent group for rapid breathing (Fisher LSD = 0.59, $p < .05$).

APPENDIX K

Mean scores and standard deviations for self-mutilation and control participants for imagery questionnaires and VAS measures assessing clarity and accuracy of imagery

Table 18.
Mean scores and standard deviations for self-mutilation and control groups for the Betts QMI Vividness of Imagery Scale and the Gordon Test of Visual Imagery Control.

Imagery Scale	Self-Mutilation		Control	
	M	SD	M	SD
Betts	79.41	(25.27)	79.07	(22.53)
Gordon	15.38	(3.10)	15.02	(3.24)

Table 19.
Mean scores and standard deviations for the VAS measures unclear/clear and not close/very close for each stage of each script for self-mutilation and control participants.

	STAGE							
VAS	**Scene**		**Approach**		**Incident**		**Consequence**	
	M	SD	M	SD	M	SD	M	SD
Unclear/Clear								
Self-mutilation								
Self-mutilation	79.80	(20.38)	85.16	(14.89)	85.91	(13.21)	84.57	(15.65)
Accidental Injury								
Self-mutilation	84.32	(15.28)	85.91	(13.87)	85.91	(13.56)	85.20	(14.89)
Control	83.98	(15.92)	85.68	(14.69)	88.26	(14.32)	89.02	(11.86)
Anger								
Self-mutilation	80.12	(20.53)	84.48	(13.94)	86.55	(12.74)	87.02	(12.23)
Control	82.73	(15.05)	84.52	(13.26)	87.36	(11.84)	86.84	(14.27)
Neutral								
Self-mutilation	89.11	(13.74)	88.32	(11.72)	89.45	(10.40)	90.45	(10.04)
Control	89.68	(10.60)	88.52	(10.13)	90.00	(9.90)	90.70	(10.11)

(table continues)

Table 19. *(continued)*

Not close/Very close								
Self-mutilation								
Self-mutilation	80.23	(13.98)	81.05	(13.96)	83.07	(13.69)	83.16	(13.92)
Accidental Injury								
Self-mutilation	83.82	(13.21)	83.70	(12.66)	85.73	(11.99)	85.11	(11.06)
Control	82.14	(15.20)	83.41	(16.05)	91.89	(40.22)	85.11	(16.67)
Anger								
Self-mutilation	83.12	(16.05)	86.10	(9.78)	86.24	(10.16)	87.60	(8.79)
Control	87.57	(13.84)	87.50	(12.66)	88.07	(11.87)	89.70	(10.44)
Neutral								
Self-mutilation	86.48	(11.18)	87.32	(11.10)	87.73	(9.86)	89.30	(9.06)
Control	89.18	(9.14)	89.23	(8.72)	90.00	(8.23)	90.91	(7.89)

Table 20.
Mean scores and standard deviations for the total sample of participants for the VAS measures unclear/clear and not close/very close.

	STAGE							
VAS	**Scene**		**Approach**		**Incident**		**Consequence**	
	M	SD	M	SD	M	SD	M	SD
Unclear/Clear								
Accidental Injury	84.15	(15.51)	85.80	(14.20)	87.08	(13.91)	87.11	(13.52)
Anger	81.45	(17.87)	84.50	(13.52)	86.97	(12.22)	86.93	(13.23)
Neutral	89.40	(12.20)	88.42	(10.89)	89.73	(10.10)	90.58	(10.02)
Not close/Very close								
Accidental Injury	82.98	(14.19)	83.56	(14.37)	88.81	(29.67)	85.11	(14.06)
Anger	85.40	(15.04)	86.81	(11.30)	87.17	(11.04)	88.67	(9.67)
Neutral	87.83	(10.24)	88.27	(9.97)	88.86	(9.10)	90.10	(8.49)

APPENDIX L

Post hoc analyses for script x stage interactions for the total sample of participants for VAS measures assessing clarity of imagery

Table 21.
Between stage post hoc comparisons for each control script for the VAS measures unclear/clear for the total sample of participants.

	Scripts		
VAS	**Injury**	**Anger**	**Neutral**
Unclear/clear (df = 6, 252)			
Fisher LSD = p < .05	2.05	2.56	1.38
Scene/Approach	ns	*	ns
Scene/Incident	*	*	ns
Scene/Consequence	*	*	ns
Approach/Incident	ns	ns	ns
Approach/Consequence	ns	ns	*
Incident/Consequence	ns	ns	ns

* Fisher LSD = $p < .05$; ns = not significant.

Table 22.
Between script post hoc comparisons for each stage for unclear/clear for the total sample of participants.

	Scene			
VAS	**Scene**	**Approach**	**Incident**	**Consequence**
Unclear/clear (df = 6, 252)				
Fisher LSD = p < .05	3.60	2.62	2.83	2.63
Injury/Anger	ns	ns	ns	ns
Injury/Neutral	*	*	ns	*
Anger/Neutral	*	*	ns	*

* Fisher LSD = $p < .05$; ns = not significant.

APPENDIX M

Mean scores and standard deviations for each of the psychophysiological measures for self-mutilation and control participants

Table 23.
Mean scores and standard deviations for the psychophysiological measures for each stage of each script for the self-mutilation and control groups.

	STAGE							
Dependent variable	**Scene**		**Approach**		**Incident**		**Consequence**	
	M	SD	M	SD	M	SD	M	SD
FPA								
Self-mutilation								
SM	0.07	(0.31)	0.16	(0.26)	-0.07	(0.42)	-0.15	(0.52)
Accidental Injury								
SM	-0.06	(0.43)	-0.15	(0.61)	0.09	(0.38)	0.00	(0.36)
Control	-0.07	(0.24)	-0.04	(0.33)	0.10	(0.35)	-0.05	(0.48)
Anger								
SM	0.03	(0.23)	0.15	(0.21)	0.17	(0.23)	0.02	(0.29)
Control	0.00	(0.36)	0.02	(0.39)	0.00	(0.59)	-0.16	(0.71)
Neutral								
SM	-0.20	(0.41)	-0.30	(0.46)	-0.38	(0.64)	-0.33	(0.63)
Control	-0.24	(0.34)	-0.27	(0.48)	-0.37	(0.60)	-0.31	(0.54)
HR								
Self-mutilation								
SM	76.44	(10.21)	78.41	(12.62)	75.43	(11.22)	74.19	(10.25)
Accidental Injury								
SM	69.75	(17.57)	73.19	(10.68)	74.92	(11.55)	75.07	(11.57)
Control	71.52	(9.20)	72.00	(9.14)	73.53	(8.97)	73.10	(8.82)
Anger								
SM	72.26	(9.90)	73.06	(11.05)	73.24	(10.36)	73.96	(10.29)
Control	73.01	(9.84)	74.54	(10.05)	75.73	(10.13)	75.03	(10.06)
Neutral								
SM	74.05	(11.66)	73.56	(12.01)	72.83	(10.97)	73.07	(10.94)
Control	70.06	(9.62)	70.64	(9.41)	70.30	(9.42)	70.72	(9.32)

(table continues)

Table 23. *(continued)*

RESP								
Self-mutilation								
Self-mutilation	17.16	(4.17)	18.13	(4.08)	16.33	(4.60)	16.39	(3.52)
Accidental Injury								
Self-mutilation	16.30	(3.64)	16.71	(3.43)	17.77	(3.56)	17.71	(3.53)
Control	16.21	(3.62)	16.76	(3.56)	18.66	(3.97)	18.16	(3.66)
Anger								
Self-mutilation	16.49	(3.53)	17.43	(3.87)	18.91	(4.32)	18.96	(4.43)
Control	16.96	(3.60)	17.90	(4.36)	19.25	(4.44)	18.73	(3.85)
Neutral								
Self-mutilation	16.11	(3.55)	16.11	(3.45)	16.27	(2.78)	16.21	(2.95)
Control	15.72	(3.76)	16.48	(3.61)	16.67	(3.80)	16.45	(3.57)
SCL								
Self-mutilation								
Self-mutilation	7.03	(5.50)	7.35	(5.76)	6.63	(5.28)	6.86	(5.93)
Accidental Injury								
Self-mutilation	7.92	(6.86)	7.93	(7.28)	8.60	(7.72)	8.71	(8.12)
Control	6.62	(4.35)	6.54	(4.69)	7.83	(5.21)	7.28	(4.63)
Anger								
Self-mutilation	6.63	(6.71)	7.55	(7.24)	7.96	(7.51)	8.41	(7.80)
Control	6.84	(4.26)	7.27	(4.58)	11.37	(19.14)	7.03	(4.05)
Neutral								
Self-mutilation	6.48	(6.22)	7.02	(7.50)	7.16	(7.91)	7.36	(8.04)
Control	5.90	(4.14)	6.06	(4.92)	5.42	(4.45)	5.88	(1.00)

FPA = millivolts, HR = beats per minute, RESP = breaths per minute, SCL = micromhos.

APPENDIX N

Post hoc analyses for script x stage interactions for the total sample of participants' psychophysiological response to control imagery

Table 24.
Between stage post hoc comparisons for each script for the psychophysiological measures for the total sample of participants.

	Scripts		
Dependent variable	**Injury**	**Anger**	**Neutral**
FPA (df = 6, 213)			
Fisher LSD = $p < .05$	0.08	0.07	0.10
Scene/Approach	ns	ns	ns
Scene/Incident	*	ns	*
Scene/Consequence	ns	*	ns
Approach/Incident	*	ns	ns
Approach/Consequence	ns	*	ns
Incident/Consequence	*	*	ns
HR (df = 6, 246)			
Fisher LSD = $p < .05$	1.47	0.80	0.65
Scene/Approach	ns	*	ns
Scene/Incident	*	*	ns
Scene/Consequence	*	*	ns
Approach/Incident	*	*	ns
Approach/Consequence	ns	ns	ns
Incident/Consequence	ns	ns	ns
RESP (df = 6, 234)			
Fisher LSD = $p < .05$	0.55	0.65	0.39
Scene/Approach	ns	*	*
Scene/Incident	*	*	*
Scene/Consequence	*	*	*
Approach/Incident	*	*	ns
Approach/Consequence	*	*	ns
Incident/Consequence	ns	ns	ns
SCL (df = 6, 111)			
Fisher LSD = $p < .05$	0.58	2.88	0.44
Scene/Approach	ns	ns	ns
Scene/Incident	*	*	ns
Scene/Consequence	*	ns	ns
Approach/Incident	*	ns	ns
Approach/Consequence	*	ns	ns
Incident/Consequence	ns	ns	ns

* Fisher LSD = $p < .05$; ns = not significant.

Table 25.
Between script post hoc comparisons for each stage for the psychophysiolgical measures for the total sample of participants.

	Scene			
Dependent variable	**Scene**	**Approach**	**Incident**	**Consequence**
FPA (df = 6, 213)				
Fisher LSD = $p < .05$	0.10	0.13	0.16	0.17
Injury/Anger	ns	*	ns	ns
Injury/Neutral	*	*	*	*
Anger/Neutral	*	*	*	*
HR (df = 6, 246)				
Fisher LSD = $p < .05$	1.65	1.16	1.23	1.05
Injury/Anger	*	*	ns	*
Injury/Neutral	ns	ns	*	*
Anger/Neutral	*	*	*	*
RESP (df = 6, 234)				
Fisher LSD = $p < .05$	0.53	0.66	0.76	0.75
Injury/Anger	*	*	ns	*
Injury/Neutral	ns	ns	*	*
Anger/Neutral	*	*	*	*
SCL (df = 6, 111)				
Fisher LSD = $p < .05$	0.70	0.80	3.41	0.94
Injury/Anger	ns	ns	ns	ns
Injury/Neutral	*	ns	ns	*
Anger/Neutral	ns	*	*	*

* Fisher PLSD = $p < .05$; ns = not significant.

APPENDIX 0

Mean scores and standard deviations for each of the VAS measures for self-mutilation and control participants

Table 26.
Mean scores and standard deviations on the VAS measures for each stage of each script for the self-mutilation and control groups.

Dependent variable	STAGE							
	Scene		Approach		Incident		Consequence	
	M	SD	M	SD	M	SD	M	SD
Relaxed/Tense								
Self-mutilation								
SM	61.29	(28.05)	75.83	(22.97)	70.69	(26.63)	42.88	(30.68)
Accidental Injury								
SM	16.48	(18.23)	23.27	(23.29)	72.14	(21.48)	61.32	(25.67)
Control	24.32	(24.20)	37.14	(26.14)	74.30	(16.97)	68.34	(23.59)
Anger								
SM	38.60	(31.47)	73.07	(20.62)	86.38	(15.32)	79.05	(20.51)
Control	28.25	(27.53)	41.05	(34.88)	48.05	(39.52)	47.25	(38.89)
Neutral								
SM	15.41	(15.97)	14.95	(15.89)	13.32	(15.36)	10.18	(9.39)
Control	15.68	(17.40)	24.89	(26.52)	41.23	(35.92)	39.05	(35.99)
Relaxed/Anxious								
Self-mutilation								
SM	60.24	(27.51)	75.83	(19.35)	71.07	(25.51)	46.93	(31.63)
Accidental Injury								
SM	20.09	(21.17)	25.25	(23.70)	70.05	(19.60)	60.95	(25.28)
Control	20.52	(21.63)	25.91	(25.83)	46.59	(36.93)	41.91	(36.49)
Anger								
SM	39.07	(31.56)	67.74	(20.65)	79.71	(17.11)	75.57	(21.83)
Control	34.98	(29.58)	47.45	(29.83)	69.18	(24.01)	67.93	(21.91)
Neutral								
SM	18.57	(20.54)	17.41	(19.59)	14.18	(17.46)	10.48	(10.95)
Control	10.36	(10.33)	9.91	(8.75)	10.09	(10.83)	9.02	(11.00)

(table continues)

Table 26. *(continued)*

Calm/Angry				
Self-mutilation				
SM	57.19 (31.53)	68.21 (28.99)	61.17 (31.26)	38.57 (30.50)
Accidental Injury				
SM	15.20 (15.46)	19.66 (17.16)	58.34 (27.42)	52.59 (28.29)
Control	18.77 (21.41)	29.39 (27.91)	56.93 (23.37)	51.36 (26.06)
Anger				
SM	35.60 (33.79)	67.10 (27.42)	88.98 (13.10)	80.19 (23.44)
Control	25.98 (30.62)	35.18 (33.54)	49.61 (42.13)	48.59 (41.22)
Neutral				
SM	12.05 (14.70)	13.02 (15.12)	10.14 (11.08)	10.11 (10.38)
Control	17.05 (14.86)	20.73 (20.18)	35.39 (30.25)	33.93 (31.27)
Unafraid/Afraid				
Self-mutilation				
SM	38.57 (30.43)	46.29 (32.79)	46.40 (32.62)	40.10 (31.59)
Accidental Injury				
SM	13.16 (14.44)	18.02 (20.72)	47.52 (29.51)	38.98 (27.28)
Control	19.16 (16.52)	26.02 (19.84)	41.70 (28.06)	36.30 (30.94)
Anger				
SM	21.79 (23.55)	32.98 (30.65)	39.19 (32.09)	38.83 (34.22)
Control	16.73 (22.09)	24.11 (22.68)	35.25 (31.68)	33.39 (29.31)
Neutral				
Self-mutilation	11.23 (16.01)	13.18 (15.77)	10.55 (13.97)	9.55 (12.77)
Control	6.89 (11.03)	8.68 (12.71)	8.14 (12.34)	8.45 (12.52)
Happy/Sad				
Self-mutilation				
SM	70.07 (27.28)	76.79 (22.97)	75.00 (22.48)	67.17 (27.03)
Accidental Injury				
SM	26.11 (19.01)	24.32 (20.09)	53.18 (21.30)	52.32 (22.22)
Control	29.77 (21.66)	38.32 (22.80)	62.14 (16.69)	53.89 (24.34)
Anger				
SM	39.00 (27.47)	58.83 (21.89)	68.93 (18.14)	66.02 (22.33)
Control	35.86 (21.76)	42.02 (23.10)	45.93 (23.84)	48.70 (27.21)
Neutral				
SM	29.70 (21.83)	28.77 (22.10)	25.93 (22.81)	24.16 (21.41)
Control	51.84 (32.85)	53.00 (32.50)	54.52 (32.86)	49.25 (35.25)

(table continues)

Table 26. *(continued)*

Normal/Unreal				
Self-mutilation				
SM	46.05 (30.99)	57.55 (31.19)	66.50 (28.88)	51.36 (27.04)
Accidental Injury				
SM	13.73 (16.00)	15.02 (17.44)	39.70 (32.04)	32.55 (28.37)
Control	23.27 (29.14)	27.48 (31.84)	48.32 (34.84)	44.86 (37.08)
Anger				
SM	17.45 (20.00)	29.33 (30.95)	39.48 (35.04)	38.69 (35.09)
Control	30.00 (30.93)	33.02 (32.59)	40.02 (34.66)	36.89 (34.82)
Neutral				
SM	10.36 (12.39)	11.75 (13.65)	10.61 (12.33)	10.93 (14.11)
Control	13.09 (20.67)	13.89 (19.95)	13.05 (20.83)	11.43 (19.64)
Relieved/Uptight				
Self-mutilation				
SM	73.45 (23.61)	78.88 (19.52)	65.64 (26.19)	45.29 (29.05)
Accidental Injury				
SM	44.30 (20.41)	44.66 (21.26)	66.07 (23.06)	61.00 (21.58)
Control	42.16 (22.47)	51.98 (20.78)	73.82 (14.20)	63.32 (24.79)
Anger				
SM	55.36 (25.60)	76.14 (19.06)	78.40 (26.67)	72.86 (26.03)
Control	47.23 (26.77)	55.14 (30.29)	60.02 (31.21)	55.77 (32.62)
Neutral				
SM	39.80 (19.37)	37.50 (19.47)	34.00 (20.67)	31.61 (20.80)
Control	60.41 (25.07)	60.82 (24.70)	59.84 (26.19)	56.14 (29.63)

APPENDIX P

Post hoc analyses for script x stage interactions for the total sample of participants' VAS response to imagery

Table 27.
Between stage post hoc comparisons for each script for the VAS measures for the total sample of participants.

	Scripts		
Dependent variable	**Injury**	**Anger**	**Neutral**
Relaxed/tense (df = 6, 252)			
Fisher LSD = p < .05	5.49	5.88	5.06
Scene/Approach	*	*	ns
Scene/Incident	*	*	*
Scene/Consequence	*	*	*
Approach/Incident	*	*	*
Approach/Consequence	*	*	ns
Incident/Consequence	*	ns	ns
Relaxed/anxious (df = 6, 252)			
Fisher LSD = p < .05	5.64	6.11	2.58
Scene/Approach	ns	*	ns
Scene/Incident	*	*	ns
Scene/Consequence	*	*	*
Approach/Incident	*	*	ns
Approach/Consequence	*	*	*
Incident/Consequence	*	ns	ns
Calm/angry (df = 6, 252)			
Fisher LSD = p < .05	5.56	6.40	3.71
Scene/Approach	*	*	ns
Scene/Incident	*	*	*
Scene/Consequence	*	*	*
Approach/Incident	*	*	*
Approach/Consequence	*	*	*
Incident/Consequence	*	ns	ns
Unafraid/afraid (df = 6, 252)			
Fisher LSD = p < .05	5.80	5.49	1.65
Scene/Approach	*	*	*
Scene/Incident	*	*	ns
Scene/Consequence	*	*	ns
Approach/Incident	*	*	ns
Approach/Consequence	*	*	*
Incident/Consequence	*	ns	ns

(table continues)

Table 27. *(continued)*

Happy/sad (df = 6, 252)			
Fisher LSD = p < .05	4.96	4.88	2.29
Scene/Approach	ns	*	ns
Scene/Incident	*	*	ns
Scene/Consequence	*	*	*
Approach/Incident	*	*	ns
Approach/Consequence	*	*	*
Incident/Consequence	ns	ns	*
Normal/unreal (df = 6, 252)			
Fisher LSD = p < .05	4.96	4.35	1.74
Scene/Approach	ns	*	ns
Scene/Incident	*	*	ns
Scene/Consequence	*	*	ns
Approach/Incident	*	*	ns
Approach/Consequence	*	*	ns
Incident/Consequence	*	ns	ns
Relieved/uptight (df = 6, 252)			
Fisher LSD = p < .05	4.97	5.67	2.79
Scene/Approach	*	*	ns
Scene/Incident	*	*	*
Scene/Consequence	*	*	*
Approach/Incident	*	ns	ns
Approach/Consequence	*	ns	*
Incident/Consequence	*	ns	*

* Fisher LSD = $p < .05$; ns = not significant.

Table 28.
Between script post hoc comparisons for each stage for the VAS measures for the total sample of participants.

	Scene			
Dependent variable	**Scene**	**Approach**	**Incident**	**Consequence**
Relaxed/tense (df = 6, 252)				
Fisher LSD = p < .05	6.15	8.12	10.14	10.08
Injury/Anger	*	*	ns	ns
Injury/Neutral	ns	*	*	*
Anger/Neutral	*	*	*	*
Relaxed/anxious (df = 6, 252)				
Fisher LSD = p < .05	5.60	5.92	6.06	6.40
Injury/Anger	*	*	*	*
Injury/Neutral	*	*	*	*
Anger/Neutral	*	*	*	*
Calm/angry (df = 6, 252)				
Fisher LSD = p < .05	6.29	8.10	10.15	10.01
Injury/Anger	*	*	*	*
Injury/Neutral	ns	ns	*	*
Anger/Neutral	*	*	*	*
Unafraid/afraid (df = 6, 252)				
Fisher LSD = p < .05	4.55	5.43	7.15	6.97
Injury/Anger	ns	*	*	ns
Injury/Neutral	*	*	*	*
Anger/Neutral	*	*	*	*
Happy/sad (df = 6, 252)				
Fisher LSD = p < .05	6.87	7.79	8.23	8.66
Injury/Anger	*	*	ns	ns
Injury/Neutral	*	*	*	*
Anger/Neutral	ns	*	*	*
Normal/unreal (df = 6, 252)				
Fisher LSD = p < .05	5.51	6.25	7.21	7.43
Injury/Anger	*	*	ns	ns
Injury/Neutral	*	*	*	*
Anger/Neutral	*	*	*	*
Relieved/uptight (df = 6, 111)				
Fisher LSD = p < .05	7.08	7.61	8.48	8.72
Injury/Anger	*	*	ns	ns
Injury/Neutral	ns	ns	*	*
Anger/Neutral	ns	*	*	*

* Fisher LSD = $p < .05$; ns = not significant.

APPENDIX Q

Between stage post hoc comparisons for the self-mutilation groups' psychophysiological and VAS response to control imagery

Table 29.
Between stage post hoc comparisons for each of the control scripts for the psychophysiological measures for self-mutilation participants.

	Scripts		
Dependent variable	**Injury**	**Anger**	**Neutral**
FPA (df = 9, 102)			
Fisher LSD = $p < .05$	0.11	0.08	0.21
Scene/Approach	ns	*	ns
Scene/Incident	*	*	ns
Scene/Consequence	ns	ns	ns
Approach/Incident	*	ns	ns
Approach/Consequence	*	*	ns
Incident/Consequence	ns	*	ns
HR (df = 9, 120)			
Fisher LSD = $p < .05$	2.74	1.09	0.97
Scene/Approach	ns	*	ns
Scene/Incident	*	*	ns
Scene/Consequence	*	*	ns
Approach/Incident	ns	ns	ns
Approach/Consequence	ns	ns	ns
Incident/Consequence	ns	ns	ns
RESP (df = 9, 114)			
Fisher LSD = $p < .05$	0.77	0.80	0.56
Scene/Approach	ns	*	ns
Scene/Incident	*	*	*
Scene/Consequence	*	*	*
Approach/Incident	*	*	ns
Approach/Consequence	*	*	ns
Incident/Consequence	ns	ns	ns
SCL (df = 9, 69)			
Fisher LSD = $p < .05$	0.50	0.62	0.58
Scene/Approach	ns	*	ns
Scene/Incident	*	*	ns
Scene/Consequence	*	*	ns
Approach/Incident	*	ns	ns
Approach/Consequence	*	*	ns
Incident/Consequence	ns	ns	ns

* Fisher LSD = $p < .05$; ns = not significant.

Table 30.
Between control script post hoc comparisons for each stage for the psychophysiological measures for self-mutilation participants.

	Scene			
Dependent variable	**Scene**	**Approach**	**Incident**	**Consequence**
FPA (df = 9, 102)				
Fisher LSD = p < .05	0.14	0.18	0.20	0.22
Injury/Anger	ns	*	ns	ns
Injury/Neutral	*	ns	*	ns
Anger/Neutral	*	*	*	*
HR (df = 9, 120)				
Fisher LSD = p < .05	2.78	2.20	1.97	1.75
Injury/Anger	ns	ns	ns	ns
Injury/Neutral	ns	ns	*	*
Anger/Neutral	ns	ns	*	*
RESP (df = 9, 114)				
Fisher LSD = p < .05	0.86	0.91	0.95	1.04
Injury/Anger	ns	ns	ns	ns
Injury/Neutral	ns	ns	*	*
Anger/Neutral	ns	*	*	*
SCL (df = 9, 69)				
Fisher LSD = p < .05	0.86	1.12	1.19	1.11
Injury/Anger	*	ns	ns	ns
Injury/Neutral	*	ns	*	*
Anger/Neutral		ns	ns	ns

* Fisher LSD = $p < .05$; ns = not significant.

Table 31.
Between stage post hoc comparisons for each of the control scripts for the VAS measures for self-mutilation participants.

	Scripts		
Dependent variable	**Injury**	**Anger**	**Neutral**
Relaxed/Tense (df = 9, 120)			
Fisher LSD = p < .05	8.31	8.94	3.08
Scene/Approach	ns	*	ns
Scene/Incident	*	*	ns
Scene/Consequence	*	*	*
Approach/Incident	*	*	ns
Approach/Consequence	*	ns	*
Incident/Consequence	*	ns	*
Relaxed/Anxious (9, 120)			
Fisher LSD = p < .05	8.10	9.52	4.80
Scene/Approach	ns	*	ns
Scene/Incident	*	*	ns
Scene/Consequence	*	*	*
Approach/Incident	*	*	ns
Approach/Consequence	*	ns	*
Incident/Consequence	*	ns	ns
Calm/Angry (df = 9, 120)			
Fisher LSD = p < .05	7.68	10.03	2.78
Scene/Approach	ns	*	ns
Scene/Incident	*	*	ns
Scene/Consequence	*	*	ns
Approach/Incident	*	*	*
Approach/Consequence	*	*	*
Incident/Consequence	ns	ns	ns
Unafraid/Afraid (df = 9, 120)			
Fisher LSD = p < .05	8.65	8.85	2.86
Scene/Approach	ns	*	ns
Scene/Incident	*	*	ns
Scene/Consequence	*	*	ns
Approach/Incident	*	ns	ns
Approach/Consequence	*	ns	*
Incident/Consequence	ns	ns	ns

(table continues)

Table 31. *(continued)*

Happy/Sad (df = 9, 120)			
Fisher LSD = p .05	6.83	7.64	3.52
Scene/Approach	ns	*	ns
Scene/Incident	*	*	*
Scene/Consequence	*	*	*
Approach/Incident	*	*	ns
Approach/Consequence	*	ns	*
Incident/Consequence	ns	ns	ns
Normal/Unreal (df = 9, 120)			
Fisher LSD = p < .05	7.20	7.89	2.89
Scene/Approach	ns	*	ns
Scene/Incident	*	*	ns
Scene/Consequence	*	*	ns
Approach/Incident	*	*	ns
Approach/Consequence	*	*	ns
Incident/Consequence	ns	ns	ns
Relieved/Uptight (df = 9, 120)			
Fisher LSD = p < .05	7.47	9.19	4.65
Scene/Approach	ns	*	ns
Scene/Incident	*	*	*
Scene/Consequence	*	*	*
Approach/Incident	*	ns	ns
Approach/Consequence	*	ns	*
Incident/Consequence	ns	ns	ns

* Fisher LSD = $p < .05$; ns = not significant.

Table 32.
Between control script post hoc comparisons for each stage for the VAS measures for self-mutilation participants.

	Scene			
Dependent variable	**Scene**	**Approach**	**Incident**	**Consequence**
Relaxed/Tense (df = 9, 120)				
Fisher LSD = p < .05	9.43	8.98	8.36	9.22
Injury/Anger	*	*	*	*
Injury/Neutral	ns	ns	*	*
Anger/Neutral	*	*	*	*
Relaxed/Anxious (df = 9, 120)				
Fisher LSD = p < .05	9.56	8.41	7.85	9.61
Injury/Anger	*	*	*	*
Injury/Neutral	ns	ns	*	*
Anger/Neutral	*	*	*	*
Calm/Angry (df = 9, 120)				
Fisher LSD = p < .05	9.73	8.88	9.47	9.87
Injury/Anger	*	*	*	*
Injury/Neutral	ns	ns	*	*
Anger/Neutral	*	*	*	*
Unafraid/Afraid (df = 9, 120)				
Fisher LSD = p < .05	7.61	10.01	11.23	10.26
Injury/Anger	*	*	ns	ns
Injury/Neutral	ns	ns	*	*
Anger/Neutral	*	*	*	*
Happy/Sad (df = 9, 120)				
Fisher LSD = p < .05	8.60	8.33	8.35	9.32
Injury/Anger	*	*	*	*
Injury/Neutral	ns	ns	*	*
Anger/Neutral	*	*	*	*
Normal/Unreal (df = 9, 120)				
Fisher LSD = p < .05	7.83	8.80	9.58	9.56
Injury/Anger	ns	*	ns	ns
Injury/Neutral	ns	ns	*	*
Anger/Neutral	*	*	*	*
Relieved/Uptight (df = 9, 120)				
Fisher LSD = p < .05	7.54	7.82	10.20	10.10
Injury/Anger	*	*	*	*
Injury/Neutral	ns	*	*	*
Anger/Neutral	*	*	*	*

* Fisher LSD = $p < .05$; ns = not significant.

APPENDIX R

Mean scores and standard deviations for current and recovered self-mutilation groups' psychophysiological and VAS response to imagery

Table 33.
Mean scores and standard deviations for the psychophysiological measures for each stage of each script for the current and recovered self-mutilation groups.

	STAGE							
Dependent variable	**Scene**		**Approach**		**Incident**		**Consequence**	
	M	SD	M	SD	M	SD	M	SD
FPA								
Self-mutilation								
Current SM	0.10	(0.25)	0.21	(0.29)	-0.05	(0.50)	-0.08	(0.48)
Recovered SM	0.04	(0.35)	0.12	(0.24)	-0.08	(0.35)	-0.19	(0.55)
Accidental injury								
Current SM	0.12	(0.21)	0.10	(0.36)	0.28	(0.23)	0.16	(0.18)
Recovered SM	-0.17	(0.49)	-0.27	(0.69)	-0.04	(0.40)	-0.09	(0.45)
Anger								
Current SM	0.01	(0.22)	0.08	(0.25)	0.09	(0.25)	0.02	(0.27)
Recovered SM	0.05	(0.24)	0.17	(0.20)	0.22	(0.22)	0.03	(0.33)
Neutral								
Current SM	-0.04	(0.19)	-0.06	(0.18)	-0.08	(0.19)	-0.07	(0.32)
Recovered SM	-0.31	(0.47)	-0.44	(0.52)	-0.58	(0.73)	-0.29	(0.83)
HR								
Self-mutilation								
Current SM	75.36	(10.78)	78.58	(15.27)	75.00	(13.67)	74.14	(12.73)
Recovered SM	77.26	(9.91)	78.27	(10.51)	75.76	(9.23)	74.23	(8.17)
Accidental injury								
Current SM	71.23	(18.89)	75.17	(10.76)	76.78	(11.70)	76.85	(11.90)
Recovered SM	72.81	(8.16)	73.63	(9.22)	74.59	(9.06)	74.59	(7.97)
Anger								
Current SM	72.97	(10.20)	73.85	(11.67)	73.79	(11.09)	74.61	(10.69)
Recovered SM	74.47	(9.47)	76.21	(9.76)	76.81	(9.64)	76.48	(10.31)
Neutral								
Current SM	75.29	(11.70)	74.59	(12.21)	74.16	(11.17)	74.53	(11.02)
Recovered SM	72.42	(10.29)	72.82	(10.36)	71.95	(10.27)	72.21	(10.06)

(table continues)

Table 33. *(continued)*

RESP								
Self-mutilation								
Current SM	17.49	(3.18)	17.92	(2.88)	16.34	(3.17)	16.87	(2.74)
Recovered SM	16.89	(4.89)	18.30	(4.91)	16.33	(5.58)	16.00	(4.08)
Accidental injury								
Current SM	16.66	(2.94)	16.39	(3.24)	17.84	(3.33)	17.55	(2.51)
Recovered SM	15.78	(4.41)	17.07	(4.25)	18.43	(4.22)	18.28	(4.04)
Anger								
Current SM	16.99	(3.22)	17.47	(3.91)	19.33	(4.23)	19.50	(4.57)
Recovered SM	16.23	(3.68)	17.73	(4.01)	18.73	(4.20)	18.55	(3.94)
Neutral								
Current SM	16.47	(3.42)	16.39	(3.23)	16.17	(2.87)	16.25	(3.11)
Recovered SM	15.20	(4.06)	16.26	(4.06)	16.57	(3.77)	16.43	(3.40)
SCL								
Self-mutilation								
Current SM	5.66	(4.96)	5.20	(4.24)	4.62	(4.07)	4.57	(4.33)
Recovered SM	7.98	(5.81)	8.82	(6.30)	8.01	(5.69)	8.43	(6.48)
Accidental injury								
Current SM	4.87	(5.01)	4.54	(5.18)	5.10	(5.43)	4.67	(5.46)
Recovered SM	8.84	(6.74)	8.88	(7.24)	9.81	(7.48)	9.83	(8.08)
Anger								
Current SM	4.39	(5.63)	4.92	(5.32)	4.98	(5.44)	4.99	(5.31)
Recovered SM	7.60	(6.66)	8.51	(7.51)	9.08	(7.74)	9.61	(8.03)
Neutral								
Current SM	4.60	(4.75)	4.43	(5.17)	4.12	(5.23)	4.13	(5.25)
Recovered SM	7.24	(6.33)	7.98	(7.64)	8.22	(8.03)	8.41	(8.15)

FPA = millivolts, HR = beats per minute, RESP = breaths per minute, SCL = micromhos.

Table 34.
Mean scores and standard deviations for the VAS measures for each stage of each script for current and recovered self-mutilation groups.

Dependent variable	STAGE							
	Scene		Approach		Incident		Consequence	
	M	SD	M	SD	M	SD	M	SD
Relaxed/Tense								
Self-mutilation								
Current SM	67.05	(25.27)	74.70	(28.08)	59.60	(31.78)	33.85	(29.49)
Recovered SM	55.13	(28.88)	76.67	(18.32)	79.92	(16.57)	51.99	(29.82)
Accidental injury								
Current SM	13.55	(21.21)	22.65	(27.49)	71.65	(25.30)	62.50	(27.10)
Recovered SM	18.92	(15.35)	23.79	(19.72)	72.54	(18.26)	60.33	(24.96)
Anger								
Current SM	38.16	(34.65)	80.37	(16.12)	85.47	(20.30)	77.90	(18.83)
Recovered SM	38.96	(29.37)	67.04	(22.27)	87.13	(9.95)	80.00	(22.17)
Neutral								
Current SM	11.95	(15.35)	13.35	(17.28)	11.45	(17.27)	7.15	(7.51)
Recovered SM	18.29	(16.23)	16.29	(14.89)	14.88	(13.77)	12.71	(10.17)
Relaxed/Anxious								
Self-mutilation								
Current SM	68.30	(24.23)	76.80	(22.69)	59.45	(31.12)	38.55	(30.99)
Recovered SM	54.46	(28.32)	76.00	(16.27)	80.71	(13.50)	53.13	(29.99)
Accidental injury								
Current SM	22.65	(27.49)	28.20	(30.16)	71.45	(22.01)	58.20	(26.22)
Recovered SM	17.96	(14.25)	22.79	(16.88)	68.88	(17.74)	63.25	(24.79)
Anger								
Current SM	37.95	(33.73)	70.21	(17.24)	77.68	(18.45)	70.46	(22.71)
Recovered SM	40.00	(30.38)	65.70	(23.27)	81.39	(26.14)	79.78	(20.62)
Neutral								
Current SM	15.37	(20.31)	16.47	(21.51)	11.74	(16.75)	9.00	(12.44)
Recovered SM	19.00	(18.05)	16.39	(15.80)	13.83	(13.60)	11.87	(9.98)

(table continues)

Table 34. *(continued)*

Calm/Angry								
Self-mutilation								
Current SM	67.95	(29.03)	71.25	(30.58)	51.15	(33.32)	33.90	(29.90)
Recovered SM	46.08	(30.37)	63.50	(27.55)	67.71	(27.69)	42.54	(29.89)
Accidental injury								
Current SM	14.05	(19.90)	18.47	(19.45)	57.21	(32.17)	55.90	(30.52)
Recovered SM	15.91	(11.62)	18.91	(12.84)	61.09	(22.99)	52.35	(26.46)
Anger								
Current SM	33.27	(36.99)	75.42	(24.71)	89.90	(14.38)	75.74	(29.10)
Recovered SM	37.52	(31.62)	60.22	(28.15)	88.22	(12.23)	83.87	(17.44)
Neutral								
Current SM	6.79	(7.32)	9.37	(8.00)	6.95	(6.59)	8.00	(8.04)
Recovered SM	14.96	(16.46)	13.30	(13.36)	11.13	(11.06)	11.61	(12.26)
Unafraid/Afraid								
Self-mutilation								
Current SM	40.45	(30.57)	47.55	(34.32)	34.35	(30.03)	32.00	(30.50)
Recovered SM	38.04	(32.40)	45.21	(31.85)	56.50	(31.67)	46.38	(30.36)
Accidental injury								
Current SM	6.74	(7.35)	15.36	(22.36)	41.63	(30.55)	34.79	(26.87)
Recovered SM	17.04	(16.22)	18.61	(17.39)	55.13	(27.38)	44.09	(27.81)
Anger								
Current SM	19.26	(22.42)	29.47	(30.33)	37.00	(34.16)	32.00	(29.09)
Recovered SM	23.87	(24.75)	35.87	(31.28)	41.00	(30.93)	44.48	(37.63)
Neutral								
Current SM	6.47	(8.15)	8.79	(11.41)	7.05	(8.95)	6.73	(7.79)
Recovered SM	12.61	(15.26)	16.57	(18.67)	13.04	(17.16)	11.78	(15.95)
Happy/Sad								
Self-mutilation								
Current SM	83.53	(20.27)	85.37	(17.42)	77.21	(24.03)	68.95	(28.11)
Recovered SM	58.53	(27.66)	69.69	(24.88)	73.17	(21.49)	65.70	(26.65)
Accidental injury								
Current SM	29.00	(20.09)	27.32	(22.17)	54.26	(23.95)	53.00	(25.90)
Recovered SM	24.74	(18.57)	22.78	(19.00)	55.34	(17.26)	55.04	(16.56)
Anger								
Current SM	37.37	(26.97)	60.21	(19.23)	66.05	(17.41)	63.21	(20.15)
Recovered SM	40.35	(28.42)	57.70	(24.24)	71.30	(18.77)	68.35	(24.19)
Neutral								
Current SM	30.26	(23.07)	27.90	(22.93)	25.26	(24.53)	26.53	(24.27)
Recovered SM	25.74	(18.05)	26.22	(19.43)	23.22	(19.33)	19.78	(16.46)

(table continues)

Table 34. *(continued)*

Normal/Unreal								
Self-mutilation								
Current SM	47.26	(34.62)	55.42	(34.78)	62.11	(35.63)	47.05	(27.88)
Recovered SM	45.04	(28.40)	59.30	(28.57)	70.13	(22.04)	54.91	(26.41)
Accidental injury								
Current SM	14.68	(19.97)	13.21	(17.14)	40.05	(32.28)	33.79	(31.12)
Recovered SM	11.61	(11.01)	16.09	(18.41)	40.44	(33.66)	33.26	(27.24)
Anger								
Current SM	15.74	(17.01)	30.74	(32.80)	32.37	(31.53)	27.11	(25.88)
Recovered SM	18.87	(22.45)	28.17	(30.02)	45.35	(37.35)	48.26	(39.19)
Neutral								
Current SM	9.63	(12.14)	8.21	(8.13)	8.58	(8.83)	9.42	(9.99)
Recovered SM	8.65	(9.55)	13.13	(15.06)	10.48	(12.48)	10.57	(14.50)
Relieved/Uptight								
Self-mutilation								
Current SM	81.42	(17.04)	83.26	(15.52)	56.42	(29.06)	39.79	(29.54)
Recovered SM	66.87	(26.48)	75.26	(21.97)	73.26	(21.30)	49.83	(28.47)
Accidental injury								
Current SM	50.53	(17.27)	50.90	(17.45)	66.95	(23.04)	63.37	(20.81)
Recovered SM	41.39	(21.33)	39.83	(22.78)	68.83	(21.00)	60.96	(20.99)
Anger								
Current SM	55.53	(23.10)	82.32	(13.96)	72.16	(30.24)	64.00	(28.48)
Recovered SM	55.22	(55.22)	71.04	(21.39)	83.57	(22.71)	80.17	(21.80)
Neutral								
Current SM	42.05	(14.72)	40.26	(16.21)	37.95	(18.29)	37.00	(16.11)
Recovered SM	35.57	(20.89)	33.83	(20.31)	27.26	(18.83)	28.83	(23.70)
Unclear/Clear								
Self-mutilation								
Current SM	78.74	(21.52)	88.16	(11.01)	87.05	(12.48)	85.58	(11.75)
Recovered SM	79.83	(20.57)	82.13	(17.67)	84.25	(14.26)	82.96	(18.82)
Accidental injury								
Current SM	83.79	(18.59)	85.32	(16.61)	84.63	(17.72)	84.95	(15.81)
Recovered SM	84.09	(12.95)	85.74	(12.02)	86.87	(9.88)	84.74	(14.90)
Anger								
Current SM	81.79	(18.20)	85.58	(12.33)	86.68	(11.52)	86.79	(11.12)
Recovered SM	78.74	(22.58)	83.57	(15.37)	86.44	(13.93)	87.22	(13.32)
Neutral								
Current SM	87.68	(17.40)	87.32	(14.67)	87.90	(13.11)	90.21	(10.47)
Recovered SM	90.04	(10.81)	89.00	(9.45)	90.61	(8.05)	90.65	(10.27)

(table continues)

Table 34. *(continued)*

Not close/Very close								
Self-mutilation								
Current SM	77.37	(15.01)	78.32	(16.30)	82.84	(14.12)	82.11	(15.39)
Recovered SM	81.44	(13.16)	82.35	(11.94)	82.39	(13.89)	83.04	(13.08)
Accidental injury								
Current SM	81.00	(17.14)	83.00	(16.23)	85.53	(15.64)	86.84	(10.04)
Recovered SM	85.48	(9.26)	84.04	(9.91)	85.65	(8.89)	83.09	(11.96)
Anger								
Current SM	81.79	(15.04)	83.84	(10.77)	84.21	(12.36)	87.58	(6.91)
Recovered SM	84.22	(17.10)	87.96	(8.68)	87.91	(7.79)	87.61	(10.25)
Neutral								
Current SM	84.16	(12.83)	88.95	(9.34)	87.74	(11.11)	91.58	(6.69)
Recovered SM	87.70	(9.78)	85.48	(12.65)	87.35	(9.32)	87.26	(10.65)

APPENDIX S

Mean scores and standard deviations for male and female self-mutilation participants' psychophysiological and VAS response to imagery

Table 35.
Mean scores and standard deviations for the psychophysiological measures for each stage of each script for male and female self-mutilation participants.

	STAGE							
Dependent variable	**Scene**		**Approach**		**Incident**		**Consequence**	
	M	SD	M	SD	M	SD	M	SD
FPA								
Self-mutilation								
Male	0.10	(0.31)	0.23	(0.28)	0.01	(0.34)	-0.01	(0.33)
Female	0.05	(0.33)	0.94	(0.23)	-0.15	(0.48)	-0.28	(0.63)
Accidental injury								
Male	0.04	(0.36)	-0.04	(0.50)	0.18	(0.32)	0.63	(0.29)
Female	-0.13	(0.47)	-0.22	(0.68)	0.00	(0.40)	-0.06	(0.44)
Anger								
Male	0.06	(0.23)	0.19	(0.22)	0.23	(0.24)	0.05	(0.26)
Female	0.01	(0.23)	0.09	(0.22)	0.11	(0.23)	0.01	(0.34)
Neutral								
Male	-0.21	(0.42)	-0.20	(0.41)	-0.19	(0.38)	-0.38	(0.51)
Female	-0.34	(0.53)	0.43	(0.71)	-0.19	(0.39)	-0.23	(0.86)
HR								
Self-mutilation								
Male	73.99	(9.28)	75.47	(10.91)	73.15	(9.92)	73.14	(9.88)
Female	77.43	(10.85)	79.94	(13.95)	76.34	(12.25)	74.34	(10.83)
Accidental injury								
Male	70.01	(19.23)	73.42	(10.53)	74.82	(11.29)	74.93	(10.54)
Female	72.94	(8.89)	74.39	(9.73)	75.24	(9.94)	75.29	(9.54)
Anger								
Male	71.61	(8.83)	72.51	(8.64)	72.77	(8.81)	73.58	(8.55)
Female	75.34	(10.14)	77.03	(11.47)	77.39	(10.93)	77.11	(11.41)
Neutral								
Male	72.49	(10.37)	72.18	(10.62)	70.46	(10.47)	71.64	(10.49)
Female	73.91	(11.29)	73.98	(11.43)	73.98	(10.48)	73.63	(10.24)

(table continues)

Table 35. *(continued)*

RESP								
Self-mutilation								
Male	17.94	(4.54)	18.78	(3.95)	17.22	(4.54)	17.25	(3.76)
Female	16.91	(3.85)	18.00	(4.11)	15.98	(4.59)	15.77	(3.45)
Accidental injury								
Male	17.25	(3.72)	18.22	(3.46)	19.31	(3.34)	18.41	(2.58)
Female	15.60	(3.77)	16.27	(3.64)	17.54	(4.10)	17.90	(3.93)
Anger								
Male	17.25	(3.45)	17.78	(4.35)	19.88	(4.21)	19.44	(2.76)
Female	16.12	(3.46)	17.50	(3.69)	18.42	(4.12)	18.67	(4.98)
Neutral								
Male	17.09	(3.97)	17.50	(3.62)	17.28	(3.16)	17.28	(3.18)
Female	15.19	(3.27)	15.77	(3.46)	16.02	(3.35)	15.92	(3.16)
SCL								
Self-mutilation								
Male	7.24	(4.73)	8.58	(7.59)	7.59	(5.09)	7.34	(6.47)
Female	6.46	(5.92)	6.81	(6.11)	6.30	(5.70)	6.66	(6.66)
Accidental injury								
Male	8.18	(5.33)	8.34	(5.87)	8.70	(6.33)	8.67	(6.17)
Female	7.12	(7.01)	6.94	(7.43)	7.68	(7.78)	7.79	(8.33)
Anger								
Male	6.24	(4.73)	6.73	(5.42)	7.07	(5.28)	7.84	(5.52)
Female	6.34	(7.01)	7.20	(7.45)	7.58	(7.81)	7.73	(8.05)
Neutral								
Male	6.39	(4.49)	5.96	(4.92)	6.09	(5.45)	6.52	(6.21)
Female	6.17	(6.54)	6.91	(7.84)	6.93	(8.17)	6.95	(8.13)

FPA = millivolts, HR = beats per minute, RESP = breaths per minute, SCL = micromhos.

Table 36.
Mean scores and standard deviations for the VAS measures for each stage of each script for male and female self-mutilation participants.

	STAGE							
Dependent variable	**Scene**		**Approach**		**Incident**		**Consequence**	
	M	SD	M	SD	M	SD	M	SD
Relaxed/tense								
Self-mutilation								
Male	52.59	(31.83)	67.53	(30.65)	67.53	(25.51)	41.35	(27.83)
Female	67.20	(24.06)	81.48	(13.90)	72.84	(27.68)	43.92	(32.99)
Accidental injury								
Male	20.11	24.15	30.47	(26.52)	80.71	(12.07)	64.35	(19.76)
Female	11.80	10.04	16.84	(18.98)	67.52	(23.68)	61.92	(28.45)
Anger								
Male	36.41	(31.76)	73.35	(19.09)	81.53	(20.73)	76.47	(21.38)
Female	40.08	(31.84)	72.88	(21.99)	89.68	(9.29)	80.80	(20.15)
Neutral								
Male	14.06	(13.08)	12.35	(13.14)	12.88	(11.28)	11.59	(11.86)
Female	14.16	(15.27)	14.44	(12.39)	11.36	(13.20)	9.32	(7.60)
Relaxed/anxious								
Self-mutilation								
Male	52.71	(31.10)	72.12	(24.09)	66.65	(27.01)	47.94	(30.93)
Female	65.36	(24.09)	78.36	(15.37)	74.08	(24.53)	46.24	(32.71)
Accidental injury								
Male	25.94	(25.47)	29.71	(24.57)	77.35	(15.89)	63.06	(22.18)
Female	15.32	(17.60)	19.60	(21.55)	66.76	(20.82)	62.12	(26.68)
Anger								
Male	40.29	(32.37)	67.77	(19.59)	72.88	(18.60)	72.06	(23.47)
Female	38.24	(31.64)	67.72	(21.74)	84.36	(14.62)	77.96	(20.79)
Neutral								
Male	19.88	(22.58)	17.12	(20.43)	11.53	(10.16)	9.65	(11.82)
Female	15.64	(16.32)	15.96	(17.23)	13.80	(17.63)	11.20	(10.81)

(table continues)

Table 36. *(continued)*

Calm/angry								
Self-mutilation								
Male	51.94	(35.33)	68.35	(32.11)	54.71	(34.93)	34.24	(31.51)
Female	60.76	(28.87)	68.12	(27.37)	65.56	(28.40)	41.52	(30.08)
Accidental injury								
Male	15.24	(13.99)	21.06	(15.47)	63.41	(24.29)	57.88	(25.95)
Female	14.96	(17.08)	17.12	(16.39)	56.56	(29.22)	51.28	(29.64)
Anger								
Male	30.18	(30.95)	64.18	(25.99)	86.18	(15.90)	73.71	(29.99)
Female	39.28	(35.73)	69.08	(28.71)	90.88	(10.74)	84.60	(17.01)
Neutral								
Male	11.00	(13.59)	11.71	(12.32)	9.35	(8.29)	10.18	(11.93)
Female	11.44	(13.94)	11.40	(10.82)	9.16	(10.32)	9.84	(9.85)
Unafraid/afraid								
Self-mutilation								
Male	35.65	(28.52)	50.12	(31.11)	42.82	(30.32)	44.00	(20.02)
Female	40.56	(32.09)	43.68	(33.85)	48.84	(28.40)	37.44	(33.55)
Accidental injury								
Male	14.65	(16.22)	25.18	(25.07)	50.24	(28.96)	48.00	(25.28)
Female	10.84	(12.10)	11.68	(12.68)	48.20	(30.09)	34.36	(27.99)
Anger								
Male	16.24	(22.24)	26.77	(28.28)	34.47	(29.98)	40.82	(35.06)
Female	25.56	(24.10)	37.20	(32.03)	42.40	(33.66)	37.48	(34.30)
Neutral								
Male	10.41	(11.48)	13.18	(15.60)	11.29	(14.07)	10.53	(12.73)
Female	9.44	(13.83)	12.96	(16.76)	9.68	(14.59)	8.80	13.43)
Happy/sad								
Self-mutilation								
Male	71.88	(30.17)	77.24	(28.50)	75.18	(24.13)	75.24	(27.18)
Female	68.84	(25.71)	76.48	(18.97)	74.88	(21.81)	61.68	(26.05)
Accidental injury								
Male	32.41	(19.91)	28.59	(22.38)	55.29	(22.28)	53.82	(21.41)
Female	22.76	(17.98)	22.28	(18.91)	54.56	(19.30)	54.32	(21.23)
Anger								
Male	35.77	(26.13)	56.47	(19.06)	67.41	(15.40)	66.47	(19.07)
Female	41.20	(28.66)	60.44	(23.87)	69.96	(20.03)	65.72	(24.69)
Neutral								
Male	37.35	(21.33)	34.82	(22.15)	32.59	(23.97)	29.65	(22.37)
Female	21.28	(17.15)	21.64	(18.47)	18.40	(18.10)	18.20	(17.92)

(table continues)

Table 36. *(continued)*

Normal/unreal								
Self-mutilation								
Male	37.00	(29.71)	50.18	(28.75)	61.41	(29.29)	49.53	(27.46)
Female	52.20	(30.86)	62.56	(32.34)	69.96	(28.68)	52.60	(27.25)
Accidental injury								
Male	18.29	(20.09)	20.88	(23.61)	47.77	(31.50)	43.89	(28.59)
Female	9.40	(10.57)	10.64	(10.89)	35.16	(33.04)	26.64	(27.22)
Anger								
Male	14.88	(13.54)	30.82	(27.97)	41.18	(28.58)	41.29	(31.12)
Female	19.20	(23.52)	28.32	(33.35)	38.32	(39.36)	36.92	(38.08)
Neutral								
Male	14.06	(13.90)	11.94	(10.31)	12.12	(11.69)	14.71	(15.70)
Female	5.72	(6.04)	10.20	(13.99)	7.92	(10.21)	6.88	(8.23)
Relieved/uptight								
Self-mutilation								
Male	74.41	(24.65)	74.12	(24.34)	65.88	(23.59)	49.71	(30.70)
Female	72.80	(23.38)	82.12	(15.13)	65.48	(28.30)	42.28	(28.11)
Accidental injury								
Male	55.00	(12.94)	52.12	(16.83)	69.65	(25.04)	62.53	(22.94)
Female	39.08	(21.42)	39.88	(22.47)	66.84	(19.57)	61.72	(19.49)
Anger								
Male	54.35	(21.93)	77.35	(13.04)	76.77	(28.83)	67.53	(60.26)
Female	56.04	(28.25)	75.32	(22.49)	79.52	(25.65)	76.48	(22.65)
Neutral								
Male	40.53	(17.63)	39.24	(19.31)	33.94	(17.27)	37.53	(21.80)
Female	37.12	(19.20)	35.04	(18.37)	30.84	(20.56)	29.12	(19.80)
Unclear/clear								
Self-mutilation								
Male	77.06	(17.56)	82.47	(16.98)	85.47	(9.39)	86.77	(11.79)
Female	80.88	(22.89)	86.48	(13.93)	85.56	(15.75)	82.36	(18.18)
Accidental injury								
Male	83.41	(11.58)	85.18	(9.77)	86.94	(8.65)	80.59	(15.49)
Female	84.32	(17.98)	85.80	(16.60)	85.12	(16.61)	87.72	(14.48)
Anger								
Male	77.88	(20.78)	82.88	(11.30)	88.18	(9.62)	87.94	(10.44)
Female	81.64	(20.64)	85.56	(15.62)	85.44	(14.58)	86.40	(13.48)
Neutral								
Male	83.59	(19.29)	84.41	(14.65)	83.59	(13.46)	85.12	(13.77)
Female	92.64	(7.35)	90.84	(9.17)	93.32	(5.56)	94.08	(4.33)

(table continues)

Table 36. *(continues)*

Not close/very close								
Self-mutilation								
Male	75.12	(16.33)	74.53	(16.56)	82.82	(12.96)	83.29	(14.20)
Female	82.64	(11.54)	84.60	(10.55)	82.44	(14.64)	82.16	(14.14)
Accidental injury								
Male	82.67	(10.55)	80.59	(11.24)	85.24	(9.67)	82.82	(11.53)
Female	84.00	(15.25)	85.60	(13.74)	85.84	(13.91)	86.12	(10.94)
Anger								
Male	78.29	(18.18)	81.12	(9.91)	81.88	(12.79)	86.41	(9.37)
Female	86.40	(13.87)	89.48	(8.28)	89.20	(6.68)	88.40	(8.48)
Neutral								
Male	82.06	(12.04)	85.18	(8.78)	85.00	(8.12)	85.77	(11.66)
Female	88.84	(10.02)	88.32	(12.72)	89.24	(10.98)	91.56	(6.38)

APPENDIX T

Means and standard deviations for frequent and infrequent self-mutilation groups' psychophysiological and VAS response to imagery

Table 37.
Mean scores and standard deviations for the psychophysiological measures for each stage of each script for the frequent and infrequent self-mutilation groups.

	STAGE							
Dependent variable	**Scene**		**Approach**		**Incident**		**Consequence**	
	M	SD	M	SD	M	SD	M	SD
FPA								
Self-mutilation								
Frequent SM	0.10	(0.31)	0.15	(0.24)	-0.10	(0.44)	-0.17	(0.53)
Infrequent SM	0.01	(0.34)	0.13	(0.29)	-0.07	(0.39)	-0.19	(0.55)
Accidental injury								
Frequent SM	-0.13	(0.44)	-0.22	(0.63)	0.04	(0.37)	0.04	(0.33)
Infrequent SM	0.08	(0.36)	-0.09	(0.53)	0.16	(0.38)	-0.63	(0.49)
Anger								
Frequent SM	0.22	(0.23)	0.12	(0.24)	0.16	(0.26)	-0.01	(0.32)
Infrequent SM	0.08	(0.24)	0.15	(0.20)	0.20	(0.17)	0.09	(0.26)
Neutral								
Frequent SM	-0.20	(0.42)	-0.26	(0.42)	-0.27	(0.42)	-0.26	(0.58)
Infrequent SM	-0. 19	(0.40)	-0.41	(0.54)	-0.66	(0.92)	-0.11	(0.92)
HR								
Self-mutilation								
Frequent SM	76.51	(11.12)	79.23	(14.00)	75.49	(12.42)	74.11	(11.03)
Infrequent SM	74.36	(8.57)	74.98	(10.00)	73.00	(8.43)	72.34	(8.78)
Accidental injury								
Frequent SM	71.61	(15.31)	74.95	(9.93)	76.03	(10.06)	76.26	(9.82)
Infrequent SM	70.28	(9.50)	70.91	(8.88)	71.44	(8.53)	71.46	(7.71)
Anger								
Frequent SM	74.08	(9.61)	75.75	(10.80)	76.13	(10.59)	76.40	(10.64)
Infrequent SM	72.58	(10.08)	73.47	(10.35)	73.56	(9.70)	73.42	(9.79)
Neutral								
Frequent SM	73.76	(11.01)	74.09	(11.50)	73.33	(11.00)	73.22	(10.60)
Infrequent SM	71.64	(10.54)	70.61	(9.63)	70.29	(9.45)	70.99	(9.29)

(table continues)

Table 37. *(continued)*

RESP								
Self-mutilation								
Frequent SM	16.97	(3.83)	18.18	(4.33)	16.24	(4.56)	16.16	(3.28)
Infrequent SM	17.75	(4.76)	18.43	(3.67)	16.64	(4.77)	16.46	(4.25)
Accidental injury								
Frequent SM	16.36	(3.73)	16.68	(3.35)	18.16	(3.88)	17.78	(2.98)
Infrequent SM	15.93	(4.12)	17.50	(4.26)	18.21	(4.08)	18.54	(4.26)
Anger								
Frequent SM	16.81	(3.49)	17.80	(3.73)	18.76	(3.83)	19.28	(4.72)
Infrequent SM	15.89	(3.44)	17.07	(4.38)	19.32	(4.97)	18.36	(3.34)
Neutral								
Frequent SM	16.02	(3.79)	16.38	(3.59)	16.46	(3.61)	16.34	(3.51)
Infrequent SM	15.68	(3.57)	16.36	(3.69)	16.50	(2.88)	16.50	(2.73)
SCL								
Self-mutilation								
Frequent SM	6.41	(6.29)	7.00	(6.44)	6.36	(5.88)	6.64	(6.86)
Infrequent SM	7.25	(3.68)	7.96	(5.23)	7.31	(4.74)	7.29	(4.75)
Accidental injury								
Frequent SM	6.98	(7.20)	6.72	(7.50)	7.24	(7.86)	7.37	(8.30)
Infrequent SM	8.35	(4.95)	8.64	(5.76)	9.51	(6.10)	9.46	(6.38)
Anger								
Frequent SM	6.40	(7.08)	7.31	(7.60)	7.53	(7.66)	7.45	(7.82)
Infrequent SM	6.12	(4.88)	6.56	(5.28)	7.25	(6.17)	8.43	(6.56)
Neutral								
Frequent SM	6.04	(6.53)	6.54	(7.87)	6.34	(8.08)	6.21	(8.06)
Infrequent SM	6.64	(4.82)	6.86	(5.37)	7.44	(6.13)	8.15	(6.49)

FPA = millivolts, HR = beats per minute, RESP = breaths per minute, SCL = micromhos.

Table 38.
Mean scores and standard deviations for the VAS measures for the self-mutilation script for frequent and infrequent self-mutilation groups.

	STAGE							
Dependent variable	**Scene**		**Approach**		**Incident**		**Consequence**	
	M	SD	M	SD	M	SD	M	SD
Relaxed/Tense								
Self-mutilation								
Frequent SM	61.33	(26.80)	79.89	(17.14)	71.52	(26.12)	39.07	(31.24)
Infrequent SM	63.43	(31.08)	67.93	(31.23)	72.00	(27.24)	50.14	(30.49)
Accidental injury								
Frequent SM	12.63	(12.35)	17.63	(19.63)	69.15	(23.54)	63.11	(26.74)
Infrequent SM	19.79	(24.80)	28.57	(26.26)	79.86	(12.65)	64.86	(21.47)
Anger								
Frequent SM	39.78	(33.10)	70.59	(22.02)	87.56	(9.66)	79.82	(19.18)
Infrequent SM	33.93	(28.63)	76.71	(18.03)	83.64	(23.22)	81.00	(20.20)
Neutral								
Frequent SM	13.74	(15.12)	14.26	(12.60)	11.33	(13.62)	10.63	(10.87)
Infrequent SM	14.43	(13.43)	12.50	(13.38)	12.57	(10.09)	9.86	(6.69)
Relaxed/Anxious								
Self-mutilation								
Frequent SM	60.89	(26.18)	78.96	(15.71)	70.33	(26.23)	39.37	(30.89)
Infrequent SM	60.93	(30.94)	68.86	(24.52)	74.21	(24.89)	60.29	(30.23)
Accidental injury								
Frequent SM	17.22	(19.63)	21.59	(23.03)	67.78	(20.86)	63.11	(25.44)
Infrequent SM	20.86	(24.04)	24.29	(20.73)	76.71	(16.29)	63.71	(23.18)
Anger								
Frequent SM	37.22	(31.86)	64.26	(20.33)	80.33	(15.52)	77.00	(18.57)
Infrequent SM	40.29	(31.92)	73.07	(20.83)	77.64	(20.61)	75.93	(25.74)
Neutral								
Frequent SM	14.82	(16.09)	15.89	(17.17)	13.93	(17.72)	12.19	(13.05)
Infrequent SM	22.07	(24.02)	17.64	(21.70)	10.36	(8.00)	7.86	(5.74)

(table continues)

Table 38. *(continued)*

Calm/Angry								
Self-mutilation								
Frequent SM	57.63	(30.30)	67.19	(28.53)	60.15	(29.98)	32.22	(27.48)
Infrequent SM	58.43	(30.10)	67.93	(30.71)	66.14	(33.44)	52.00	(33.52)
Accidental injury								
Frequent SM	15.96	(17.99)	19.59	(17.76)	63.59	(25.92)	56.00	(29.64)
Infrequent SM	12.21	(10.14)	16.00	(12.12)	49.57	(28.61)	47.07	(23.22)
Anger								
Frequent SM	35.63	(35.64)	68.48	(26.44)	88.52	(11.57)	81.56	(22.11)
Infrequent SM	35.64	(32.56)	64.50	(31.03)	89.21	(16.34)	82.50	(19.43)
Neutral								
Frequent SM	10.07	(11.75)	10.48	(8.10)	8.48	(7.86)	10.00	(9.99)
Infrequent SM	13.64	(17.35)	13.36	(16.29)	10.29	(12.36)	10.29	(12.36)
Unafraid/Afraid								
Self-mutilation								
Frequent SM	42.78	(30.13)	49.41	(33.05)	44.04	(33.49)	34.41	(31.60)
Infrequent SM	29.57	(31.13)	38.21	(32.45)	48.86	(32.06)	49.14	(30.65)
Accidental injury								
Frequent SM	12.30	(14.43)	14.33	(14.88)	48.07	(32.65)	34.48	(24.88)
Infrequent SM	12.14	(13.65)	20.36	(25.86)	52.79	(22.40)	53.07	(27.86)
Anger								
Frequent SM	21.07	(22.18)	35.00	(32.55)	46.00	(33.85)	39.74	(34.96)
Infrequent SM	19.93	(24.56)	27.14	(27.24)	26.57	(26.16)	37.43	(35.25)
Neutral								
Frequent SM	10.56	(14.32)	15.26	(18.35)	11.96	(16.67)	10.78	(15.38)
Infrequent SM	7.50	(9.56)	7.50	(8.76)	6.00	(5.96)	6.21	(6.03)
Happy/Sad								
Self-mutilation								
Frequent SM	74.67	(24.60)	80.96	(20.98)	75.93	(24.13)	63.11	(28.95)
Infrequent SM	64.21	(30.34)	67.57	(25.22)	72.29	(20.18)	73.00	(22.33)
Accidental injury								
Frequent SM	30.00	(19.50)	27.52	(21.33)	58.74	(20.50)	55.07	(23.92)
Infrequent SM	18.71	(16.45)	17.93	(16.93)	47.71	(19.25)	52.57	(15.68)
Anger								
Frequent SM	39.56	(26.14)	59.07	(22.22)	66.85	(19.13)	60.93	(23.28)
Infrequent SM	37.07	(31.59)	59.14	(22.68)	73.21	(16.61)	75.86	(18.20)
Neutral								
Frequent SM	28.26	(20.20)	27.00	(20.38)	25.37	(22.02)	21.59	(20.60)
Infrequent SM	24.93	(20.54)	25.00	(21.86)	19.86	(20.52)	23.21	(19.94)

(table continues)

Table 38. *(continued)*

Normal/Unreal								
Self-mutilation								
Frequent SM	49.26	(30.06)	59.70	(32.27)	67.82	(28.84)	50.33	(28.98)
Infrequent SM	41.57	(33.66)	52.14	(30.35)	64.29	(30.93)	52.71	(24.83)
Accidental injury								
Frequent SM	12.67	(13.60)	12.89	(12.51)	35.44	(31.64)	29.22	(28.43)
Infrequent SM	12.93	(19.67)	17.79	(25.50)	47.29	(34.34)	37.93	(23.49)
Anger								
Frequent SM	16.19	(21.67)	26.18	(31.20)	36.96	(35.92)	38.92	(38.26)
Infrequent SM	19.21	(17.57)	33.64	(31.41)	42.14	(34.62)	38.50	(30.89)
Neutral								
Frequent SM	8.85	(10.22)	10.07	(11.59)	10.37	(12.60)	10.48	(14.14)
Infrequent SM	9.14	(12.15)	11.36	(14.30)	7.29	(6.17)	9.07	(9.67)
Relieved/Uptight								
Self-mutilation								
Frequent SM	72.00	(25.73)	79.67	(17.78)	60.59	(28.30)	35.41	(26.02)
Infrequent SM	77.93	(19.15)	77.29	(23.78)	75.07	(20.31)	64.93	(26.15)
Accidental injury								
Frequent SM	42.37	(20.33)	41.11	(21.39)	68.56	(19.96)	64.00	(17.26)
Infrequent SM	51.36	(19.11)	51.79	(20.02)	66.71	(26.17)	58.07	(26.99)
Anger								
Frequent SM	54.59	(27.61)	75.00	(20.38)	81.33	(22.56)	73.19	(24.01)
Infrequent SM	56.29	(23.16)	79.36	(16.91)	73.64	(34.22)	76.00	(27.53)
Neutral								
Frequent SM	37.04	(18.94)	34.56	(17.89)	31.15	(19.20)	29.15	(19.99)
Infrequent SM	40.64	(18.40)	40.00	(20.52)	32.64	(19.96)	38.86	(22.29)
Unclear/Clear								
Self-mutilation								
Frequent SM	78.63	(24.78)	89.30	(11.04)	89.85	(9.73)	85.70	(16.80)
Recovered SM	80.64	(11.28)	76.00	(18.84)	77.79	(16.38)	80.29	(14.14)
Accidental injury								
Frequent SM	84.92	(17.07)	86.82	(14.90)	85.52	(16.15)	86.22	(14.93)
Infrequent SM	82.36	(13.18)	84.21	(12.60)	86.71	(8.99)	81.71	(16.45)
Anger								
Frequent SM	80.85	(21.46)	86.93	(12.67)	89.30	(10.52)	88.59	(10.58)
Infrequent SM	78.93	(20.11)	80.00	(16.57)	81.64	(15.70)	84.36	(15.27)
Neutral								
Frequent SM	91.11	(10.30)	90.96	(8.16)	91.22	(7.79)	91.30	(9.50)
Infrequent SM	84.14	(19.15)	83.00	(16.53)	86.64	(14.40)	88.56	(12.08)

(table continues)

Table 38. *(continued)*

Not close/Very close								
Self-mutilation								
Frequent SM	80.52	(12.71)	82.52	(12.31)	85.40	(11.10)	84.30	(12.36)
Infrequent SM	77.71	(17.00)	76.64	(17.16)	76.07	(16.91)	78.50	(16.64)
Accidental injury								
Frequent SM	82.44	(15.51)	83.37	(14.51)	85.93	(13.80)	85.44	(11.07)
Infrequent SM	85.50	(8.93)	84.79	(9.77)	84.64	(9.42)	83.14	(11.91)
Anger								
Frequent SM	81.89	(18.79)	87.48	(9.28)	85.96	(11.05)	87.33	(7.64)
Infrequent SM	85.07	(9.83)	83.14	(10.75)	86.00	(8.49)	87.71	(11.16)
Neutral								
Frequent SM	84.93	(12.59)	86.81	(12.32)	87.37	(11.41)	88.82	(9.80)
Infrequent SM	88.07	(8.62)	87.29	(9.85)	88.50	(7.04)	89.86	(8.69)

APPENDIX U

Cognitive Rehearsal of Self-mutilation Scale (CROSS)

A. Cognitive Rehearsal of Self-mutilation Scale (CROSS)

Here is a list of statements regarding the way that people think about injuring themselves. Please circle the number that best indicates how each statement applies to you.

Presence of cognitive rehearsal

1.	I have recently pictured or thought about injuring myself.	Never	1	2	3	4	5	Always
2.	In the past I have pictured or thought about injuring myself.	Never	1	2	3	4	5	Always

Covert conditioning

3.	The more I think about harming myself, the more I seem to end up doing it.	Never	1	2	3	4	5	Always
4.	When I think about injuring myself I usually end up doing it.	Never	1	2	3	4	5	Always
5.	I both think about harming myself and actually do harm myself now more than I used to.	Never	1	2	3	4	5	Always
*6.	The more I think about injuring myself, the less I actually seem to do it.	Never	1	2	3	4	5	Always

Covert reinforcement

7.	I like to imagine or fantasise about feeling I get after injuring myself.	Never	1	2	3	4	5	Always
8.	I feel better when I think about harming myself.	Never	1	2	3	4	5	Always
9.	There are times when just picturing having done something to hurt myself is enough to make me feel better.	Never	1	2	3	4	5	Always
*10.	There are times when imagining that I am harming myself is not enough to make me feel better, I have to do it.	Never	1	2	3	4	5	Always
11.	I find that just thinking about the things I can do to hurt myself is enough, I don't have to do it.	Never	1	2	3	4	5	Always

Circumstances

Depression

12.	When I am feeling miserable I think about hurting myself.	Never	1	2	3	4	5	Always
13.	I find myself thinking about doing something to hurt myself when I am feeling down.	Never	1	2	3	4	5	Always
14.	I think about injuring myself when I feel sad.	Never	1	2	3	4	5	Always
15.	I find myself picturing hurting myself when I think about how others have let me down.	Never	1	2	3	4	5	Always
16.	When I feel like there is nothing left for me any more, I think about injuring myself.	Never	1	2	3	4	5	Always

Extrapunitive

17.	I like to imagine the reactions of others when I've hurt myself, for example, picture someone being sorry for what they have done to me after I have cut myself.	Never	1	2	3	4	5	Always
18.	I like to picture getting back at someone when I think about injuring myself.	Never	1	2	3	4	5	Always
19.	I like to fantasise about the look on someone's face when I have injured myself to pay them back for something terrible they have done to me.	Never	1	2	3	4	5	Always
20.	Other people make me so angry that I think about how they would react and feel if I hurt myself.	Never	1	2	3	4	5	Always
21.	When I feel angry and upset with someone I find myself thinking about or picturing harming myself to make them sorry.	Never	1	2	3	4	5	Always

Alienation

22.	I often find myself thinking about injuring myself when I am feeling lonely and left out.	Never	1	2	3	4	5	Always
23.	Thoughts about hurting myself seem to round in my head when I am feeling lonely and isolated.	Never	1	2	3	4	5	Always
24.	When I feel unwanted and unloved I think about or picture hurting myself.	Never	1	2	3	4	5	Always

25.	I find myself thinking about harming myself when I think that my friends and my family don't need me any more.	Never	1	2	3	4	5	Always
26.	I can't stop thinking about hurting myself when I am feeling lonely and afraid.	Never	1	2	3	4	5	Always

Operant

27.	I like to imagine the look on someone's face when they find out that I have injured myself.	Never	1	2	3	4	5	Always
28.	I like to think about or picture how much better others will behave towards me when they find out I have hurt myself.	Never	1	2	3	4	5	Always
29.	I think about or picture injuring myself when I can't work out any other way to make others know how I feel.	Never	1	2	3	4	5	Always
30.	I think about hurting myself when I need to show someone how they have made me feel.	Never	1	2	3	4	5	Always
31.	When I think about hurting myself I picture how people will change when they find out what I have done.	Never	1	2	3	4	5	Always

Modelling

32.	I think about or picture the things that other people I know have done to hurt themselves.	Never	1	2	3	4	5	Always
33.	I think about the ways other people injury themselves.	Never	1	2	3	4	5	Always
34.	I have images in my head of pictures that I have seen of what other people have done to hurt themselves.	Never	1	2	3	4	5	Always
35.	I think about things that I have seen on television about people that have hurt themselves.	Never	1	2	3	4	5	Always
36.	I think about pictures that I have seen of what other people have done to themselves.	Never	1	2	3	4	5	Always

Avoidance

37.	When I feel like I just need to get away I find myself thinking about or imagining harming myself.	Never	1	2	3	4	5	Always
38.	When I feel trapped in a situation I find that I think about hurting myself to get away.	Never	1	2	3	4	5	Always
39.	I find that I think about doing something to injure myself when I feel like I just can't take it any more.	Never	1	2	3	4	5	Always
40.	I think about or picture hurting myself when I feel like I just have to leave things to others to take care of.	Never	1	2	3	4	5	Always
41.	I find myself thinking about or picturing hurting myself when I feel like I just want to die and leave things for other people to sort out.	Never	1	2	3	4	5	Always

Tension reduction

42.	Picturing or thinking about what I have done or can do to hurt myself makes me feel calmer.	Never	1	2	3	4	5	Always
43.	Thinking about hurting myself helps me to calm down when I am feeling angry or upset.	Never	1	2	3	4	5	Always
44.	Thinking about or picturing what I can do to harm myself makes me feel better when I am feeling anxious and uptight.	Never	1	2	3	4	5	Always
45.	Imagining the things that I have done to myself in the past can make me feel relaxed when I am tense and upset.	Never	1	2	3	4	5	Always
46.	When I need to calm down I find myself thinking about hurting myself.	Never	1	2	3	4	5	Always

Janus face

47.	When I think about hurting myself I don't really think about whether or not I want to live or die.	Never	1	2	3	4	5	Always
48.	When I think about harming myself I feel uncertain as to whether I want to live or die.	Never	1	2	3	4	5	Always
49.	I find that when I am thinking about hurting myself I feel like it doesn't matter if I live or die.	Never	1	2	3	4	5	Always

50.	I just think about what I can do to hurt myself, I don't care if I live or die.	Never	1	2	3	4	5	Always
51.	When I am thinking about injuring myself I am not conscious of whether or not I want to live or die.	Never	1	2	3	4	5	Always

Intropunitive

52.	I picture or think about doing harmful things to punish myself.	Never	1	2	3	4	5	Always
53.	I find that thoughts about hurting myself go round and round inside my head when I am feeling guilty and worthless.	Never	1	2	3	4	5	Always
54.	I find that I think about or picture hurting myself when I am feeling like a bad and worthless person.	Never	1	2	3	4	5	Always
55.	Thoughts or pictures about injuring myself pop into my head when I feel like I deserve to be punished.	Never	1	2	3	4	5	Always
56.	I think about or picture hurting myself when I need to pay for the things that I have done.	Never	1	2	3	4	5	Always

Quality of rehearsal

57.	I picture myself going through the motions of injuring myself, for example, I see myself taking the razor and cutting my arm.	Never	1	2	3	4	5	Always
58.	When I think about injuring myself I like to picture every detail.	Never	1	2	3	4	5	Always
*59.	When I think about injuring myself I like to picture every detail.	Never	1	2	3	4	5	Always
60.	I like to take the time to go over everything slowly in my mind when I think about hurting myself.	Never	1	2	3	4	5	Always
*61.	I find that images or thoughts about harming myself flash quickly through my mind.	Never	1	2	3	4	5	Always

Intrusive thoughts

62.	Thoughts about injuring myself just seem to pop into my head.	Never	1	2	3	4	5	Always
63.	Thoughts about injuring myself just seem to go round and round inside my head and they won't go away.	Never	1	2	3	4	5	Always
64.	I can't help thinking about injuring myself.	Never	1	2	3	4	5	Always
65.	There are times when I can't stop inking about injuring myself.	Never	1	2	3	4	5	Always

Control over thoughts and actions

66.	Injuring myself just seems to happen. I don't think about it a lot before hand.	Never	1	2	3	4	5	Always
*67.	I plan in detail what I am going to do before I do anything to harm myself.	Never	1	2	3	4	5	Always
*68.	I find that I think about it a bit before I injure myself.	Never	1	2	3	4	5	Always
69.	I don't seem to have much control over injuring myself, it just seems to happen before I know it.	Never	1	2	3	4	5	Always

* Scored in the opposite direction.

APPENDIX V

Relevant publications

THE PSYCHOPHYSIOLOGY OF SELF-MUTILATION: EVIDENCE OF TENSION REDUCTION

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Abstract. Psychophysiological and psychological arousal patterns of individuals who self-mutilate during imaged self-mutilation were examined. Imaged control events (accidental injury, anger, neutral) were compared between self-mutilation and control groups. Personalised guided imagery scripts were presented in four stages: scene setting, approach, incident, and consequence. Results depicted a decrease in psychophysiological arousal when self-mutilation participants imaged cutting themselves. A decrease in psychological response was not evident until after cutting. Responses to self-mutilation imagery were different from those demonstrated during control imagery. A comparison of responses to self-mutilation imagery between past and currently self-mutilating participants indicated no difference in the psychophysiological arousal patterns to self-mutilation imagery. A lag was evident for psychological arousal for the retrospective sample but not for the current group. These results indicated that self-mutilative behaviour is maintained by the psychophysiological and psychological tension-reducing qualities of the act. When a person is no longer engaging in the behaviour, the feelings associated with the act are open to reinterpretation.

Key words: Imagery, self-mutilation, psychophysiology,

Introduction

A range of low lethality, socially unacceptable self-mutilative behaviours that are performed without conscious suicidal intent have been described (Favazza & Rosenthal, 1993; Walsh & Rosen, 1988). They may be compulsive, including behaviours such as trichotillomania, nail biting, and skin scratching and picking. Other behaviours such as skin cutting, burning, biting, self-hitting and bone breaking, inserting objects under the skin and wound excoriation may occur episodically or repetitively in a psychiatric population (Favazza & Simeon, 1995). As self-mutilative behaviour becomes habitual, the risk to the individual increases (Walsh & Rosen, 1988).

It is difficult to comprehend why a person would repeatedly engage in a behaviour that would so threaten their physical integrity. Lack of understanding and misinterpretation of self-mutilative behaviour has hindered appropriate treatment (Ross & McKay, 1979; Van Moffaert, 1990). For self-mutilative behaviour to be managed effectively, an understanding of the factors that encourage the existence and maintenance the behaviour is required (Haines, Williams, Brain & Wilson, 1995).

Anecdotal reports have consistently portrayed self-mutilation as an effective tension reducing mechanism (Favazza, 1989). Compulsive, episodic and repetitive behaviours have all been associated with the relief from mounting anxiety or tension reduction, or feelings of gratification (Favazza & Simeon, 1995). These reports have precipitated the development of a tension reduction model of self-mutilation. However, until recently there had been no empirical investigation of this phenomenon.

The tension reduction model represents a simple drive reduction mechanism. It is likely that it is the tension reducing qualities of self-mutilation that serve to reinforce the behaviour establishing it as a behavioural cycle that is prone to be repeated with the re-emergence of negative feelings (Bennun, 1984; Favazza & Conterio, 1989). This model has indicated that the individual is trapped in a psychophysiological arousal related reinforcement process (Haines et al., 1995). This internal reinforcement pattern alone may suffice to maintain self-mutilation as a behavioural response (Walsh & Rosen, 1988). In order for self-mutilative behaviour to be managed effectively these reinforcement processes need to be clearly defined.

The measurement of the psychophysiological processes that occur during the act of self-mutilation has presented methodological difficulties. It is neither ethically nor logistically possible to record psychophysiological states while a

person is actually engaging in self-mutilative behaviour. Previous research has demonstrated the utility of using guided imagery to assess the psychophysiological processes underlying specific clinical behaviours (Brain, Haines, & Williams, 1996; Driscoll, Brain, Williams, & Haines, 1997; Haines et al., 1995; Williams, Haines, & Brain, 1995; Williams, Wilson, Montgomery & Batik, 1989). The use of guided imagery as a means of assessing psychophysiological states has been supported empirically (Borkovec & Hu, 1990; Brain, Haines, Williams, Stops & Driscoll, 1996; Cook, Melamed, Cuthbert, McNeil & Lang, 1988; Lang, 1979; Lang, Kozak, Miller, Levin & McLean, 1980; Pitman, Orr, Forgue, Altman, de Jong & Claiborn, 1987; Watkins, Clum, Borden, Broyles & Hayes, 1990).

The presentation of guided imagery information in stages has been demonstrated to accurately chart arousal changes associated with a specific behaviour as it develops over time (Brain et al., 1996; Haines et al., 1995; Williams et al., 1995; Williams et al., 1989). In this way, the specific psychophysiological reinforcement mechanisms of self-mutilative behaviour have been determined (Haines et al., 1995).

Self-mutilating prisoners were interviewed regarding the details of a previous self-mutilative episode. This information was used for the construction of personalised guided imagery scripts. Imagery scripts were presented in four stages detailing a gradual and realistic build-up to self-mutilation and reactions to the act. A significant decrease in psychophysiological arousal when the actual act of injury was being imaged was evident. Arousal remained low during the final stage of imagery when the consequences of the act were imaged. These results have provided empirical support for the tension reduction model of self-mutilation indicating that the self-mutilative act is a rapid and effective tension reducing mechanism (Haines et al., 1995).

It was of particular interest that self-mutilating prisoners did not report a decrease in emotional response until stage 4, after the act of self-mutilation was complete. That is, continued negative feelings were reported despite reduced psychophysiological arousal. This represented a lag between the reduction of psychophysiological arousal and subjective response (Haines et al., 1995). Individuals who self-mutilate often are unable to provide an explanation for their own self-mutilative behaviour (Favazza & Conterio, 1989; Simpson, 1976; Walsh & Rosen, 1988). This result has indicated that it is the alteration of psychophysiological arousal that may operate to reinforce and maintain self-mutilative behaviour, not the psychological response (Haines et al., 1995).

These results represented an important insight into the factors that maintain self-mutilative behaviour. The aim of the current study is to determine whether the psychophysiological tension reduction pattern to personalised self-mutilation imagery indicated in an incarcerated self-mutilation sample is applicable to a general population of people that self-mutilate. The escalating negative emotional state followed by the reported tension reduction upon self-injury should be evidenced in changes in psychophysiological arousal over time. The arousal pattern to self-mutilation imagery should be quite different to the types of arousal changes associated with other behaviours (Haines et al., 1995). It is expected that self-mutilation participants will respond normally to control imagery such as accidental injury, anger and neutral events. No differences in the responses of self-mutilation participants and a control group to these control imagery scripts are expected.

In clinical research it is not always practical to access people that are currently engaging in the problem behaviour. Clinicians may be reluctant to encourage clients to participate in research that is not directly involved with a current treatment programme. Some individuals simply may not be well enough to participate in research.

Anecdotal evidence has not indicated any difference in the strength or pattern of arousal associated with imaged events according to whether or not the event had occurred recently (Brain et al., 1995; Haines et al., 1995; Williams et al., 1995; Williams et al., 1989). The validity of a guided imagery methodology in the retrospective investigation of clinical behaviours does need to be clarified.

Using personalised guided imagery presented in stages it should be possible to determine the psychophysiological and psychological reinforcement mechanisms of a clinical behaviour retrospectively. It is anticipated that there will be no significant difference in the strength of the psychophysiological or psychological arousal response pattern to self-mutilation imagery between individuals who are currently engaging in self-mutilative behaviour and a retrospective sample of self-mutilation participants.

Method

Participants

Seventy people participated in this investigation. Twenty females and fifteen males with a history of self-mutilative behaviour participated from community clinics, private psychological practice and the University of Tasmania undergraduate population. The self-mutilation group was categorised according to whether participants were currently self-mutilating (present, n=15) or had not self-mutilated for more than 6 months (past, n=20). Control participants had no history of self-mutilation and were selected from the university psychology undergraduate programme. Participants were matched on the basis of age, sex and imagery ability.

Materials

Scales

The Betts QMI Vividness of Imagery Scale (Sheehan, 1967) was used to assess imagery ability.

A self-mutilative behaviour check list devised by the authors was used to determine history of self-mutilative behaviour including types of behaviour and frequency of self-mutilation.

Visual Analogue Scales (VASs) (McCormack, Horne & Sheather, 1988) were used to determine participants' subjective response to imagery. VAS scores (from 0 to 100) represented this response on seven bipolar dimensions: relaxed/tense, relaxed/anxious, calm/angry. unafraid/afraid, happy/sad, normal/unreal, and relieved/uptight (Haines et al., 1995). A higher score on these dimensions represented a more negative experience. VASs also were used to assess how clearly participants could image the information presented (unclear/clear), and to determine the accuracy of the information included in the personalised imagery scripts (not close/very close). Higher scores on these dimensions represented a more positive experience.

Imagery scripts

Self-mutilation participants were interviewed to collect information for personalised imagery scripts of 4 separate events: a) an actual incident of self-mutilation; b) accidental injury (e.g., accident with kitchen knife); c) an angry interaction (e.g., argument with significant other); and d) a low arousal neutral event (e.g., making a cup of coffee). Separate scripts detailing information relevant to the individual were written for each event for each participant. Control participants were interviewed regarding an accidental injury, anger and neutral event only. As scripts detailed events that individuals had actually experienced, the control participants did not receive a self-mutilation script. Control scripts and the control group were included to ensure that individuals who self-mutilate did not respond aberrantly to events that are experienced by most people.

Previous research regarding this guided imagery methodology examined the utility of administering a standard self-mutilation imagery script to non-mutilating participants (Haines et al., 1995). Results indicated that a tension reduction response pattern to self-mutilation imagery could not be elicited in those who had never engaged in the behaviour. Participants' responses to this standard imagery were generally a function of the ability to image a behaviour in which they had

never engaged, or the degree to which they felt comfortable thinking about inflicting injury on themselves (Haines et al., 1995).

For the present study, all participants were asked to discuss the information for the personalised imagery scripts in terms of the environment in which the event occurred, their behaviour, and their emotional and psychophysiological reactions. The information discussed was limited to the moments immediately preceding the event, the actual event and the moments immediately following the event. Using this information, guided imagery scripts presenting a chronological sequence of events were devised. Only elements reported by the individual were included in the imagery scripts in the wording used by the participants (Haines et al., 1995). In this way, participants were not directed to experience reactions they had not previously recalled.

Each imagery script was comprised of four distinct stages: 1) setting the scene (a description of the environment in which the incident occurred and the context of the situation); 2) approach to the behaviour (description of events immediately preceding the incident; 3) the incident (details of the actual event as it occurred); and 4) the consequence (description of the events immediately following the incident and the resolution phase). (Guidelines for the construction of imagery scripts are available by request from Christopher L. Williams.)

Apparatus and psychophysiological recording

Measurement of psychophysiological responses was facilitated using Chart 3.4 on a Macintosh Quadra 840AV computer linked to a MacLab/8 Data Acquisition System. Recordings were made at 1mm/s-1, with a sampling frequency of 200 sample/s-1.

Measurements were taken for finger pulse amplitude (FPA), electrocardiograph (ECG) integrated via cardiotachometer to obtain a mean heart rate (HR), respiration (RESP) and skin conductance level (SCL). These measures were selected to incorporate a range of psychophysiological responses to account for the idiosyncratic nature of participants' responses to imagery (Fleming & Baum, 1987). FPA was measured via a plethysmograph attached to the second finger of the non-dominant hand. ECG was measured using 2 Gereonics 7-mm Ag/AgCl electrodes fitted at the second rib on both sides of the torso. The electrode diameter represented paste contact (ECI Electro-Gel) with skin. One miniature Gereonics Ag/AgCl electrode placed at the left mastoid process served as an earth reference. RESP was recorded using a Pneumotrace respiration sensor band fitted around the upper torso. SCL was measured via 2 Med Associate 10-mm Ag/AgCl cup electrodes connected to the fingertips of the first and third fingers of the non-dominant hand.

Procedure

Following interview and script construction, participants attended a recording session where imagery scripts were presented while psychophysiological responses to imagery were measured. Scripts were presented in a counter-balanced order to prevent problems of adaptation-habituation.

Participants were asked to close their eyes while a one minute pre-imagery baseline recording was taken. Participants were reminded to keep their eyes closed during imagery presentation and to concentrate on imaging details currently being described. Each stage of the four stage imagery scripts was approximately 60 seconds in duration. There was a 10 second pause between stages where participants were permitted to open their eyes. This between stage pause was kept brief to allow continuity of imagery. After the presentation of each script, participants completed VASs rating their subjective responses to each stage of that script. To facilitate this process, participants were reminded of key elements of each stage prior to rating that stage.

Written informed consent was obtained prior to the commencement of the first session. Each step of the procedure was carefully explained before it occurred and each participant was debriefed at the conclusion of the recording session.

Transformation and scoring of psychophysiological data

Scores were extracted for a 30 second pre-imagery baseline recording and for a 30 second period of each stage of each imagery script. This scoring period was generally taken 15-20 seconds into each stage and was based on script content. This scoring method has been used successfully in previous research (Brain et al., 1997; Brain et al., 1996; Brain, Williams & Haines, 1996; Driscoll et al., 1997; Driscoll, Williams & Haines, 1996; Haines, Brain & Williams, 1997; Haines et al., 1995; McLaren, Haines & Williams, 1996; Williams et al., 1995).

Mean psychophysiological responses were calculated for HR and SCL. Mean number of breaths per minute were used for RESP. Change scores were calculated for FPA by subtracting the scores obtained during each stage from baseline and dividing by the baseline measure. SCL data was obtained for a limited group of participants only (n=24) due to problems with the recording equipment on this channel.

Results

History of self-mutilation

The total sample of self-mutilation participants had deliberately injured themselves a median of 30.5 times (range=3-350) over a mean period of 51.8 months (*SD*=59.2, range=2.5 months to 30 years). Cutting was the most frequently reported method of self-mutilation (97%). No differences between current and retrospective self-mutilation participants were evident in terms of history of self-mutilative behaviour.

Response to imagery

The information discussed will be limited to the self-mutilation group's response to self-mutilation imagery. Information regarding comparisons between the self-mutilation and control groups' response to control imagery and comparisons between self-mutilation and control imagery scripts is available from the authors on request.

To summarise this information, for the psychophysiological and subjective data, analyses of variance (ANOVAs) were conducted and a Huynh-Feldt correction applied. No significant differences between self-mutilation and control participants' psychophysiological response to control imagery were demonstrated. Results did indicate some between group differences on VAS measures. Self-mutilation participants reported more negative feeling than control participants during the anger script. In addition, the self-mutilation group rated their responses to neutral imagery more positively than the neutral (e.g., neither relaxed or tense) responses of control participants for this script.

The self-mutilation group's psychophysiological and subjective responses to self-mutilation imagery differed significantly from arousal patterns elicited for the control scripts. Figures 1 and 2 illustrate the variation in arousal response between the four stages of the four imagery scripts. These were indicative of the arousal patterns demonstrated for the other psychophysiological and VAS measures.

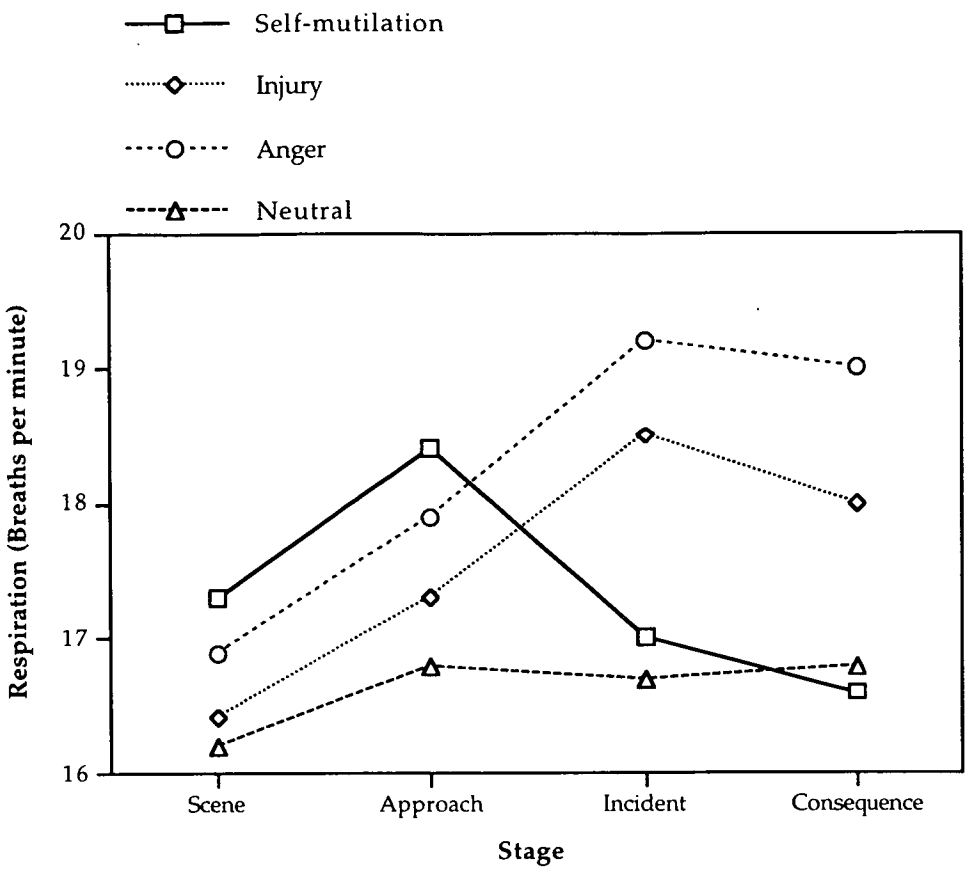

Figure 1. Variation in psychophysiological arousal across each stage of each script for RESP for the self-mutilation group.

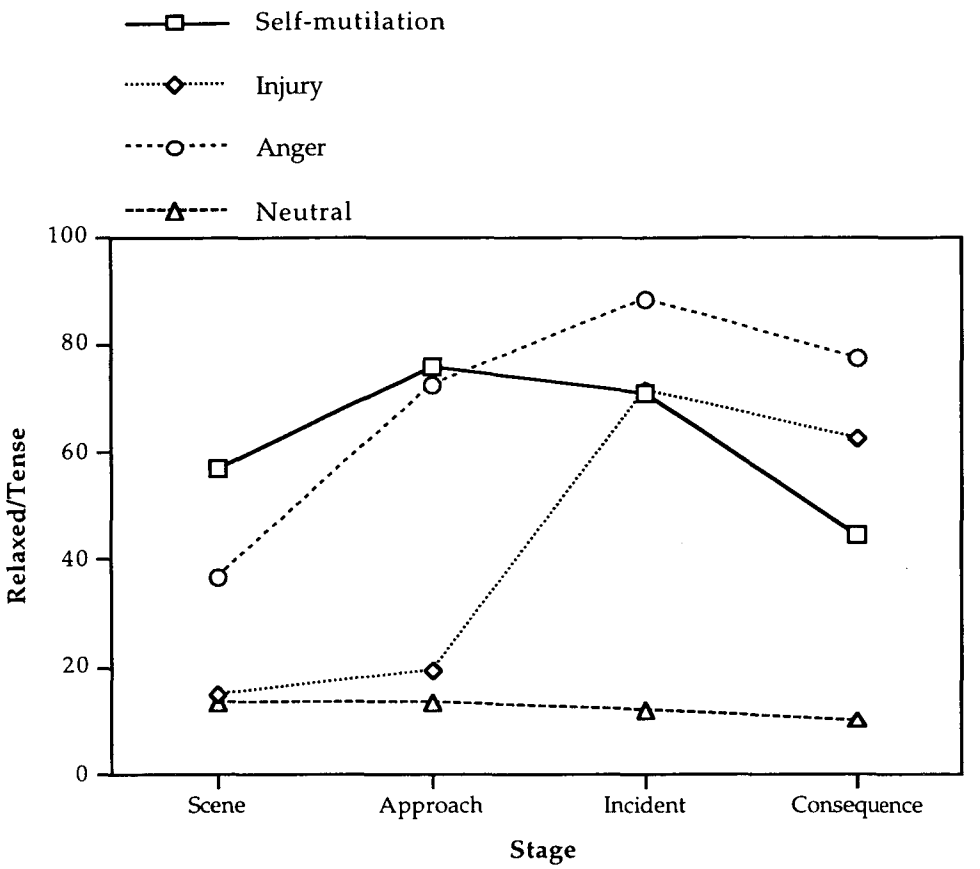

Figure 2. Variation in subjective response across each stage of each script for relaxed/tense for the self-mutilation group.

Psychophysiological response to self-mutilation imagery

Significant between stage differences were demonstrated for the self-mutilation script for all of the psychophysiological measures, FPA, $F(3,99)=9.57$, $p<.001$; HR, $F(3,102)=12.35$, $p<.001$; RESP, $F(3,96)=4.76$, $p<.01$; SCL, $F(3,51)=2.91$, $p<.05$. A significant increase in psychophysiological arousal between stage 1 and stage 2 was demonstrated for HR, $F(1,3)=10.29$, $p<.01$; and RESP, $F(1,3)=4.82$, $p<.05$. Arousal decreased significantly at stage 3 when actual self-injury was imaged for all measures, FPA, $F(1,3)=12.10$, $p<.01$, HR, $F(1,3)=17.62$, $p<.001$; RESP, $F(1,3)=7.47$, $p<.01$; SCL, $F(1,3)=7.98$, $p<.01$. This reduction in psychophysiological arousal was maintained at stage 4 when the immediate consequences of the act of self-mutilation were imaged.

Subjective response to self-mutilation imagery

Significant between stage differences for the self-mutilation script for 6 of the VAS measures were demonstrated, relaxed/tense, $F(3,102)=11.93$, $p<.001$; relaxed/anxious, $F(3,102)=9.76$, $p<.001$; calm/angry, $F(3,102)=9.70$, $p<.001$; happy/sad, $F(3,102)=2.92$, $p<.05$; normal/unreal, $F(3,102)=7.76$, $p<.001$; relieved/uptight, $F(3,102)=11.26$, $p<.001$.

Reported negative feeling increased significantly from stage 1 to stage 2 for relaxed tense, $F(1,3)=10.69$, $p<.01$; relaxed/anxious, $F(1,3)=10.48$, $p<.01$; calm/angry, $F(1,3)=6.80$, $p<.05$; unafraid/afraid, $F(1,3)=4.75$, $p<.05$; happy/sad, $F(1,3)=4.44$, $p<.05$; normal/unreal, $F(1,3)=7.82$, $p<.01$.

Reported negative feeling decreased significantly during stage 3 for relieved/uptight only, $F(1,3)=4.04$, $p<.05$.

During stage 4, reported negative feeling decreased significantly for 6 of the VAS measures, relaxed/tense, $F(1,3)=20.02$, $p<.001$; relaxed/anxious, $F(1,3)=15.55$,

$p<.001$; calm/angry, $F(1,3)=12.84$, $p<.001$; happy/sad, $F(1,3)=4.19$, $p<.05$; normal/unreal, $F(1,3)=7.41$, $p<.01$; relieved/uptight, $F(1,3)=12.04$, $p<.001$.

As for the psychophysiological dependent variables, a pattern of tension reduction during self-mutilation was evident for subjective measures. However, a significant reduction in subjective response generally did not occur until stage 4, after cutting had been completed. This lag between psychophysiological and subjective reduction in arousal to self-mutilation imagery has been demonstrated previously (Haines et al., 1995)

Retrospective and current self-mutilation participants' response to self-mutilation imagery

Group (current, retrospective self-mutilation participants) x Stage (scene setting, approach, incident, consequence) analyses were conducted to determine any difference in the strength of the arousal pattern associated with self-mutilation imagery between the current and retrospective groups.

No significant differences between the current and retrospective groups' psychophysiological responses to self-mutilation imagery were demonstrated.

Significant Group x Stage interactions were evident for 6 of the VAS measures, relaxed/tense, $F(3,99)=6.20$, $p<.001$; relaxed/anxious, $F(3,99)=5.34$, $p<.01$; calm/angry, $F(3,99)=10.15$, $p<.001$; and unafraid/afraid, $F(3,99)=5.43$, $p<.01$; happy/sad, $F(3,99)=3.07$, $p<.05$; uptight/relieved, $F(3,99)=4.45$, $p<.01$. Figure 3 depicts the different subjective response patterns of the current and retrospective groups to self-mutilation imagery for the VAS measure relaxed/tense.

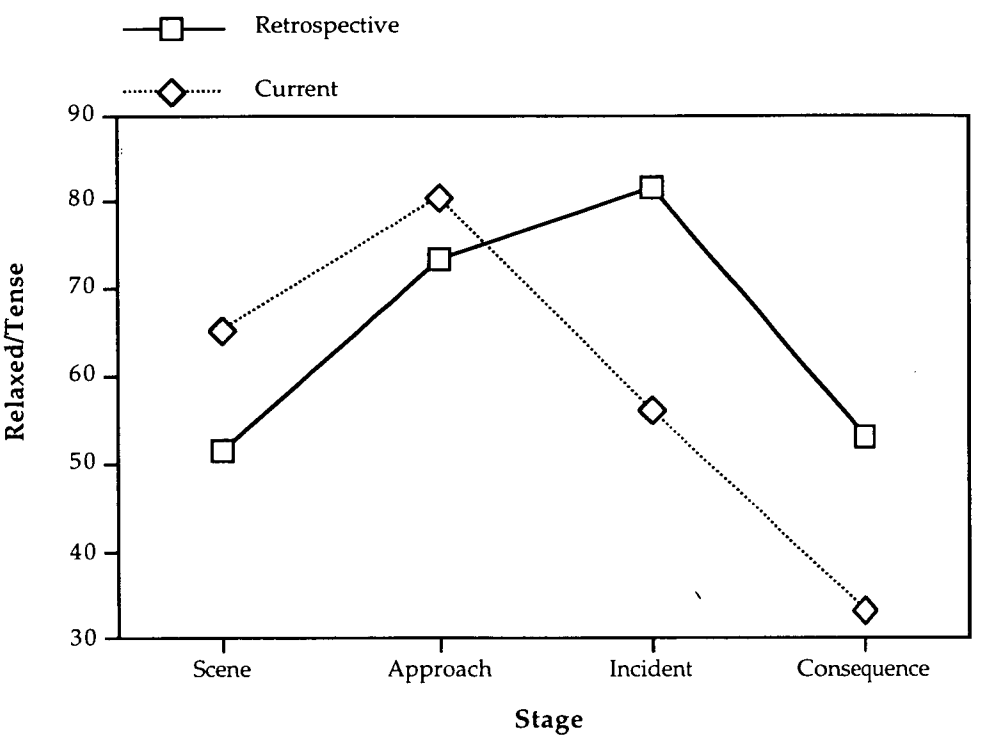

Figure 3. Variation in subjective response across the four stages of the self-mutilation script for retrospective and current self-mutilation participatns for the VAS measure relaxed/tense.

It was of particular interest that for the retrospective group, reported negative feelings did not decrease significantly until stage 4, when the consequences of self-injury were imaged, relaxed/tense, $F(1,3)=18.83$; $p<.001$; relaxed/anxious, $F(1,3)=22.37$, $p<.001$; calm/angry, $F(1,3)=17.00$, $p<.001$; and uptight/relieved,

$F(1,3)=13.38$, $p<.001$. However, for current self-mutilation participants, reported negative feelings decreased significantly during stage 3 for relaxed/tense, $F(1,3)=6.94$, $p<.01$; relaxed/anxious, $F(1,3)=5.98$, $p<.01$; calm/angry, $F(1,3)=15.07$, $p<.001$; unafraid/afraid, $F(1,3)=5.64$, $p<.05$; and relieved/uptight, $F(1,3)=12.76$, $p<.001$. These feelings continued to decrease at stage 4. This continued decrease was significant for relaxed/tense, $F(1,3)=6.23$, $p<.05$.

No differences in the pattern of subjective response to accidental injury, anger or neutral scripts were demonstrated between retrospective and current self-mutilation participants.

Summary of results

No significant differences between self-mutilation and control participants' psychophysiological responses to control imagery were demonstrated. Subjective data indicated that self-mutilation participants reported more negative feeling than control participants during the anger script and more positive feeling during neutral imagery than the control group.

The psychophysiological and subjective responses of self-mutilation participants to self-mutilation imagery were quite different to those elicited during control imagery scripts.

Initial analysis of response to self-mutilation imagery indicated a lag between the psychophysiological reduction in arousal during stage 3 when actual self-injury was depicted and the reported reduction of negative feeling, which did not occur until stage 4. Further analysis indicated that this lag between the reduction of psychophysiological and subjective arousal was evident for retrospective self-mutilation participants only. For the current group, the reduction in psychophysiological and subjective arousal occurred simultaneously, during stage 3, while actual self-injury was being imaged. This difference in arousal response patterns between retrospective and current self-mutilation participants was evident for the self-mutilation script only.

Discussion

Psychophysiological results indicated that self-mutilation participants responded appropriately to imagery of everyday events. The self-mutilation group did report more extreme subjective reactions to anger and neutral imagery than control participants. Individuals who engage in self-mutilation have been described as emotionally labile (Simpson, 1976; Zweig, Paris & Guzder, 1994). In further research, self-mutilation participants scored higher on a measure of empathy than a control group, indicating that they had a heightened sensitivity to the perceived emotional experiences of others (Brain, Haines & Williams, 1997). The extreme subjective ratings demonstrated in the current investigation may be a result of this oversensitivity.

The arousal reduction pattern demonstrated for self-mutilation imagery was unique to injury that was self-inflicted. Initial analyses replicated the lag between the reduction of psychophysiological arousal and psychological distress that has been demonstrated previously (Haines et al., 1995). These results suggested that it is the reduction in psychophysiological arousal that serves to reinforce the behaviour rather than the emotional response to the act.

Comparisons between the responses of self-mutilation participants who were currently engaging in the behaviour and a retrospective self-mutilation sample were conducted initially to determine the efficacy of a guided imagery methodology in charting the processes of a behaviour in which a person is no longer engaging. These results have clarified the reinforcement qualities of self-mutilation.

For those who were currently engaging in the behaviour, the act of self-mutilation was immediately psychophysiologically and psychologically reinforcing. For these individuals, an appropriate cognitive interpretation of the alteration in psychophysiological state that is induced by self-injury was evident.

The lag between reduction of psychophysiological arousal and negative feeling was demonstrated for the retrospective sample only. In fact, this sample interpreted the actual act of self-mutilation as stressful and anxiety provoking even though psychophysiological arousal decreased significantly during imagery depicting the self-injurious act. These results have indicated that the act of self-injury is cognitively reinterpreted when self-mutilation is no longer part of an individuals' behaviour repertoire.

Self-mutilation is a behaviour that is prone to becoming habitual due to the reinforcing elements that the act itself provides. The self-mutilative act is so immediately reinforcing that it is difficult to resist the impulse to self-mutilate when a negative emotional state is experienced (Bennum, 1983; Favazza & Simeon, 1995; Simeon, et al., 1992). Therefore, it is unlikely that individuals cease self-mutilating because it fails to provide the desired relief from psychophysiological and emotional tension. A cessation of self-mutilative behaviour is more likely due to an alteration of the psychopathology or symptomatology experienced by the individual leading to a reduced need to engage in the behaviour.

Traditional treatment suggestions for self-mutilation have focused on developing the communication and coping skills of the individual (Ballinger, 1971; Graff & Mallin, 1967; Novotny, 1972; Simpson, 1976) and substituting self-mutilation for some non-injurious tension reducing activity (Rosen & Thomas, 1984). These have proven less than adequate in the management of self-mutilative behaviour. Research has demonstrated that individuals who self-mutilate are not necessarily deficient in coping skills (Haines & Williams, 1997). It seems that individuals who self-mutilate are unable or unwilling to resist the impulse to self-mutilate long enough to consider alternative coping strategies. Instead, they use the strategy that most effectively dissipates the negative state. In that case, the actual process of an act of self-mutilation needs to be addressed in order to bring the behaviour under control.

There are two alternative approaches. Firstly, to extinguish the behaviour it would be necessary to prevent the reinforcer from occurring. Stress management techniques targeting the initial increase in tension would be required to prevent the escalation of negative affect that precedes self-mutilation. However, it should be noted that as the behaviour becomes habitual, the factors that trigger self-mutilation become increasing minor (Grunebaum & Klerman, 1967). Therefore, whereas stress management techniques would form an important part of a treatment regime, it would be difficult to prevent the relatively low level arousal that precipitates self-mutilation in those who engage in the behaviour habitually.

The results of this study have demonstrated that it is the immediate reduction in psychophysiological arousal and psychological tension that the act provides that reinforces self-mutilative behaviour. As mentioned previously, in order to effectively treat the behaviour it is necessary to prevent this reinforcement from occurring. The discrete nature of self-mutilation and the immediate reinforcement the act provides has indicated that covert sensitization (Cautela, 1967) would be the treatment of choice for extinguishing self-mutilative behaviour.

Covert sensitization has been considered a punishment procedure as an aversive stimulus is presented following the response to be reduced (Cautela, 1967). It is effective because it prevents the maladaptive approach behaviour from occurring by altering the reinforcement associated with that behaviour. It is appropriate to consider self-mutilation as a maladaptive approach behaviour as it is associated with pleasant and reinforcing consequences, that of tension reduction. If these consequences were no longer associated with the behaviour it is unlikely that an individual would be motivated to engage in self-mutilation and could consider using more adaptive strategies to cope with stressful situations.

Covert procedures for the management of self-mutilation have been recommended (Cautela & Baron, 1973) and covert sensitization has been included in a treatment package developed to address self-burning in a single case (Cox & Klinge, 1976). Unfortunately, the design of the study prevented the evaluation of efficacy of the individual components of the treatment programme. Covert sensitization also

has been identified as an effective strategy in the treatment of severe nail-biting (Daniels, 1974; Paquin, 1977). In a single case, repetitive wrist cutting behaviour was eliminated using covert sensitization (Jurgela, 1993).

The results of the current study have treatment implications and provide clear evidence for the application of covert sensitization in the treatment of self-mutilative behaviour. It is evident from the present research that it is the strength of the tension reduction that maintains this maladaptive coping strategy. Covert sensitization serves to break the association between the behaviour and the pleasant response. This cognitive behavioural procedure requires the client/patient to image the approach to the maladaptive behaviour, followed by an aversive scene. An alternative, adaptive behaviour or coping strategy is then pictured, followed by imagery depicting a reinforcing consequence. In the case reported by Jurgela (1993), habitual wrist cutting was managed using this procedure. The participant in that single case study report was currently engaging in the behaviour. The results of the present research indicate that this individual would have an accurate appreciation of the psychophysiological and psychological consequences of the act. The behaviour was successfully extinguished by altering the nature of the reinforcement pattern.

In conclusion, case studies have indicated that covert sensitization is an effective and appropriate strategy for the treatment of self-harm behaviours (Daniels, 1974; Jurgela, 1993; Paquin, 1977). It may not be appropriate for all cases of self-mutilative behaviour to be managed using this type of treatment strategy. Before embarking on any therapeutic intervention it is important to thoroughly assess the nature of the behaviour and the factors that are associated with its reinforcement. For this purpose, the guided imagery methodology employed in this study could be used as a diagnostic tool to determine the nature of the reinforcement maintaining the act of self-mutilation. In addition, the specific delineation of the nature of the individual's arousal pattern allows for the tailoring of specific stress management procedures to meet the needs of that individual.

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THE PSYCHOPHYSIOLOGY OF SELF-MUTILATIVE BEHAVIOUR: A COMPARISON OF CURRENT AND RECOVERED SELF-MUTILATORS

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1. ABSTRACT

The aim of the current investigation was to examine the tension reduction mechanisms of skin-cutting using guided imagery. Self-mutilation participants' (n=35) psychophysiological and psychological responses during a skin-cutting episode were examined using personalised guided imagery scripts. Comparison was made between the response patterns of those currently self-mutilating and a recovered sample. Results depicted a significant decrease in psychophysiological arousal for both the current and retrospective self-mutilation groups when actual cutting was imaged. Those currently mutilating reported an immediate decrease in negative feeling at this time. In contrast, the retrospective group did not report a decrease in negative feeling until after imaged cutting was complete. These results demonstrated that the act of self-injury provides an immediate reduction in psychophysiological and psychological arousal for those who are currently self-mutilating. When a person is no longer engaging in the behaviour, the feelings associated with the act are open to reinterpretation. The symptomatology currently experienced by current and recovered self-mutilation participants also was investigated. Results demonstrated few differences between current and recovered self-mutilation participants with regard to current symptomatology. These results have indicated that self-mutilative behaviour may be eliminated without significantly altering the symptomatology associated with the behaviour.

2. EXPERIMENT 1

The tension reduction model of self-mutilation has proposed that behaviours such as self-cutting and burning are effectively tension reducing (Favazza, 1989; Simpson, 1975). This model has indicated that it is these tension reducing qualities of self-mutilation that serve to reinforce the act and establish it as an habitual behaviour. Using a guided imagery methodology the specific reinforcement processes of self-mutilation have been delineated and the tension reduction pattern that has been reported in the clinical literature has been empirically verified (Haines, Williams, Brain & Wilson, 1995).

In one study, self-mutilating prisoners were interviewed regarding the details of a previous self-mutilative episode. This information was used for the construction of personalised guided imagery scripts. Script information was presented in stages to allow accurate identification of the specific reinforcement processes that the act provides. In the first stage, the environment in which the behaviour occurred and the circumstances, thoughts and feelings prior to self-mutilation were imaged. In the second stage, the approach to the behaviour was described. This included a detailed description of the events, thoughts and feelings leading up to the point of self-mutilation. The incident stage described the actual act of self-injury and the thoughts and feelings that accompanied that behaviour. The final stage of the imagery script detailed the events immediately following self-injury, and the thoughts and feelings experienced at that time. At the incident stage, when the actual act of self-injury was imaged, an immediate and significant reduction in arousal was evident. This was compared with a significant increase in psychophysiological arousal when accidental injury was imaged. Results of this study indicated that the self-mutilative behaviour is reinforced by this reduction in psychophysiological arousal (Haines et al., 1995) and that this tension reduction pattern is unique to injury that is self-inflicted. Results demonstrated no significant differences between the self-mutilation group and a control group with no history of self-mutilation in terms of psychophysiological and psychological responses to control imagery scripts depicting accidental injury, anger and neutral events. This has indicated that individuals who self-mutilate respond appropriately to events that are experienced by most people.

Using this guided imagery methodology, it was also possible to identify the psychological states during the act of self-mutilation. Individuals were asked to

rate how they were feeling during each stage of self-mutilation imagery on a number of different dimensions related to the phenomenology of self-mutilation. Results indicated a tension reduction pattern for psychological response to self-mutilation. That is, self-mutilating prisoners reported that the act of self-mutilation made them feel better. However, this reported reduction in negative feeling did not occur significantly until the consequence stage of imagery, after the act of cutting was complete. This result represented a lag between the reduction of physiological arousal and reported negative feeling (Haines et al., 1995). Individuals who self-mutilate often are unable to provide an explanation for their own self-mutilative behaviour (Favazza & Conterio, 1989; Simpson, 1976; Walsh & Rosen, 1988). Results of this study indicated that it is the alteration of psychophysiological arousal that operates to reinforce the behaviour, rather than the emotional response (Haines et al., 1995).

The aim of the current investigation was to determine whether the tension reduction pattern to self-mutilation depicted in the incarcerated sample is generalisable to a broader population of individuals who self-mutilate. It was hypothesised that the lag between the reduction in psychophysiological and psychological arousal would be replicated in a community sample of self-mutilation participants.

In clinical research it is not always practical to have access to participants who are currently engaging in problem behaviours. Clinicians may be reluctant to encourage their clients to participate in research that is not directly involved with a current treatment programme. Some people may simply not be well enough to participate in intensive research.

From a methodological point of view, it was of interest to determine the efficiency of a guided imagery methodology in the retrospective investigation of clinical behaviour. No significant difference in the strength of the psychophysiological or psychological arousal response pattern to self-mutilation imagery between individuals who were currently engaging in the behaviour and a recovered sample of self-mutilation participants was expected.

2.1. METHOD

2.1.1. Participants

Thirty-five individuals with a history of self-mutilation participated in this investigation. The self-mutilation group was categorised according to whether participants were currently self-mutilating (n=15) or had not self-mutilated for more than 6 months (n=20).

2.1.2. Materials

Visual Analogue Scales (VASs) (McCormack, Horne & Sheather, 1988) were used to determine participants' subjective response to imagery. VAS scores (from 0 to 100) represented this response on seven bipolar dimensions that related to the phenomenology of self-mutilation. These were, relaxed/tense, relaxed/anxious, calm/angry, unafraid/afraid, happy/sad, normal/unreal, and relieved/uptight (Haines et al., 1995). A higher score on these dimensions represented a more negative experience.

Measurement of psychophysiological responses was facilitated using Chart 3.4 on a Macintosh Quadra 840AV computer linked to a MacLab/8 Data Acquisition System. Recordings were made at 1mm/s-1, with a sampling frequency of 200 sample/s-1. Measurements were taken for finger pulse amplitude (FPA), electrocardiograph (ECG) integrated via cardiotachometer to obtain a mean heart rate (HR), respiration (RESP) and skin conductance level (SCL). These measures were selected to incorporate a range of psychophysiological responses to account for the idiosyncratic nature of participants' responses to imagery (Fleming & Baum, 1987).

2.1.3. Procedure

Participants were interviewed regarding an incident of self-mutilation they could clearly recall. Using this personalised information, imagery scripts were constructed comprising of four distinct stages: 1) setting the scene (a description of the environment in which the incident occurred and the context of the situation); 2) approach to the behaviour (description of events immediately preceding the incident); 3) the incident (details of the actual event as it occurred); and 4) the consequence (description of the events immediately following the incident and the resolution phase). (Guidelines for the construction of imagery scripts are available by request from Christopher L. Williams.)

Participants attended a recording session where the imagery script was presented while psychophysiological responses to imagery were measured. Participants were asked to close their eyes while a one minute pre-imagery baseline recording was taken prior to the presentation of the four stage imagery script. Participants were asked to keep their eyes closed while the imagery script was presented. Each stage was of approximately 60 seconds in duration and there was a 10 second pause between stages during which participants were permitted to open their eyes. Following script presentation, participants completed VASs rating their subjective responses to each stage of that script. To facilitate this process, participants were reminded of key elements of each stage prior to rating that stage.

2.1.4. Transformation and scoring of psychophysiological data

Scores were extracted for a 30 second pre-imagery baseline recording and for a 30 second period of each stage of the imagery script. This scoring period was generally taken 15-20 seconds into each stage and was based on script content. This scoring method has been used successfully in previous research (Brain, Haines, & Williams, 1997; Brain, Haines, Williams, Stops & Driscoll, 1996; Brain, Williams & Haines, 1996; Driscoll, Brain, Williams, & Haines, 1997; Driscoll, Williams & Haines, 1996; Haines, Brain & Williams, 1997; Haines et al., 1995; McLaren, Haines & Williams, 1996; Williams, Haines & Brain, 1995).

Mean psychophysiological responses were calculated for HR and SCL. Mean number of breaths per minute were used for RESP. Change scores were calculated for FPA by subtracting the scores obtained during each stage from baseline and dividing by the baseline measure. Results were analysed using analyses of variance (ANOVAs) with a Huynh-Feldt correction. Tables detailing means and standard deviations are available from the authors on request.

2.2. RESULTS

2.2.1. Total sample psychophysiological response to self-mutilation imagery

For the total sample, significant between stage differences for the self-mutilation script were demonstrated for all of the psychophysiological measures, FPA, $F(3,99)=9.57$, $p<.001$; HR, $F(3,102)=12.35$, $p<.001$; RESP, $F(3,96)=4.76$, $p<.01$; SCL, $F(3,51)=2.91$, $p<.05$. A significant increase in psychophysiological arousal from stage 1 to stage 2 was demonstrated for HR, $F(1,3)=10.29$, $p<.01$; and RESP, $F(1,3)=4.82$, $p<.05$. Arousal decreased significantly at stage 3 when actual self-injury was imaged for all measures, FPA, $F(1,3)=12.10$, $p<.01$, HR, $F(1,3)=17.62$, $p<.001$; RESP, $F(1,3)=7.47$, $p<.01$; SCL, $F(1,3)=7.98$, $p<.01$. This reduction in psychophysiological arousal was maintained at stage 4 when the immediate consequences of the act of self-mutilation were imaged. This arousal reduction pattern to self-mutilation imagery is illustrated in Figure 1.

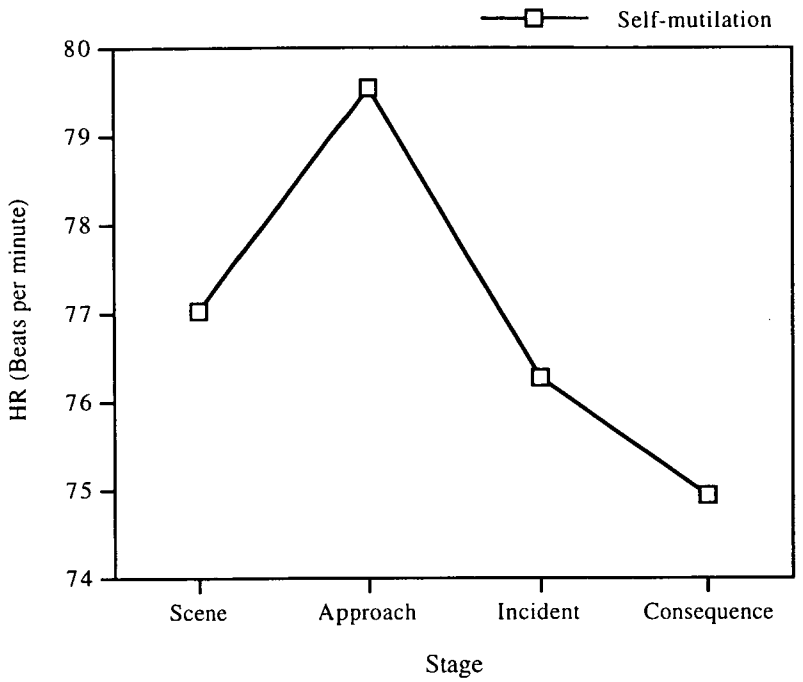

Figure 1. Pattern of arousal depicted across the four stages of the self-mutilation script for the total sample for HR

2.2.2. Total sample subjective response to self-mutilation imagery

Significant between stage differences were demonstrated for 6 of the VAS measures were demonstrated, relaxed/tense, $F(3,102)=11.93$, $p<.001$; relaxed/anxious, $F(3,102)=9.76$, $p<.001$; calm/angry, $F(3,102)=9.70$, $p<.001$; happy/sad, $F(3,102)=2.92$, $p<.05$; normal/unreal, $F(3,102)=7.76$, $p<.001$; relieved/uptight, $F(3,102)=11.26$, $p<.001$. The VAS measure unafraid/afraid was the exception.

Reported negative feeling increased significantly from stage 1 to stage 2 for relaxed tense, $F(1,3)=10.69$, $p<.01$; relaxed/anxious, $F(1,3)=10.48$, $p<.01$; calm/angry, $F(1,3)=6.80$, $p<.05$; unafraid/afraid, $F(1,3)=4.75$, $p<.05$; happy/sad, $F(1,3)=4.44$, $p<.05$; normal/unreal, $F(1,3)=7.82$, $p<.01$. Reported negative feeling decreased significantly during stage 3 for relieved/uptight only, $F(1,3)=4.04$, $p<.05$. During stage 4, reported negative feeling decreased significantly for, relaxed/tense, $F(1,3)=20.02$, $p<.001$; relaxed/anxious, $F(1,3)=15.55$, $p<.001$; calm/angry, $F(1,3)=12.84$, $p<.001$; happy/sad, $F(1,3)=4.19$, $p<.05$; normal/unreal, $F(1,3)=7.41$, $p<.01$; relieved/uptight, $F(1,3)=12.04$, $p<.001$.

As for the psychophysiological dependent variables, a pattern of tension reduction during self-mutilation was evident for subjective measures. However, a significant reduction in subjective response generally did not occur until stage 4, after cutting had been completed. This response pattern is illustrated in Figure 2. This lag between psychophysiological and subjective reduction in arousal to self-mutilation imagery has been demonstrated previously (Haines et al., 1995).

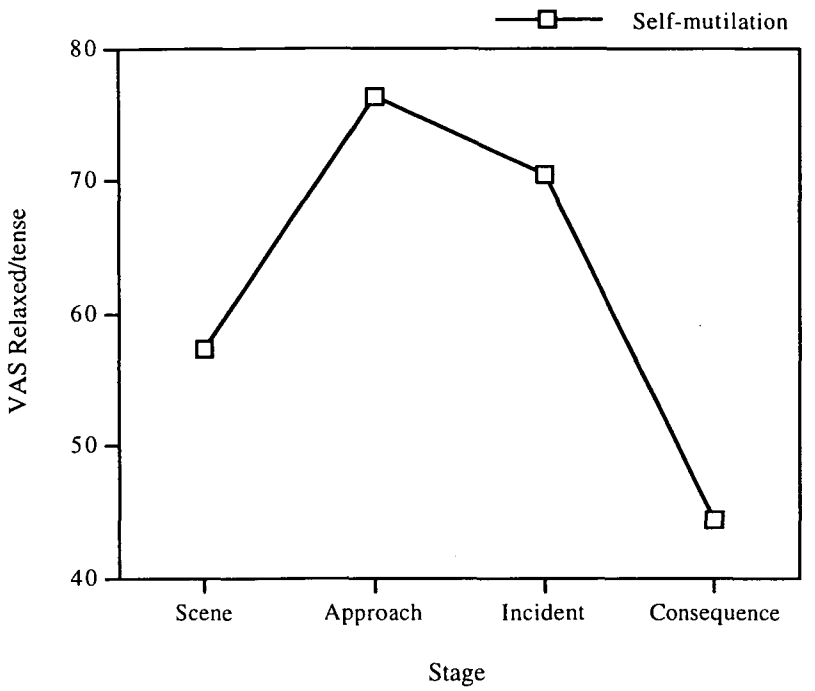

Figure 2. Pattern of subjective response depicted across the four stages of the self-mutilation script for the total sample for the VAS measure relaxed/tense

2.2.3. Comparison between current and recovered groups' response to self-mutilation imagery

Group (current, recovered) x Stage (scene setting, approach, incident, consequence) ANOVAs were conducted to determine any difference in the strength of the arousal pattern associated with self-mutilation imagery between the current and recovered groups.

No significant differences between the current and recovered groups' psychophysiological responses to self-mutilation imagery were demonstrated.

Significant Group x Stage interactions were evident for 6 of the VAS measures, relaxed/tense, $F(3,99)=6.20$, $p<.001$; relaxed/anxious, $F(3,99)=5.34$, $p<.01$; calm/angry, $F(3,99)=10.15$, $p<.001$; and unafraid/afraid, $F(3,99)=5.43$, $p<.01$; happy/sad, $F(3,99)=3.07$, $p<.05$; uptight/relieved, $F(3,99)=4.45$, $p<.01$. Normal/unreal was the exception. Post hoc analyses indicated that current self-mutilation participants reported significantly more negative feelings than the recovered participants at stage 1 of the self-mutilation script for calm/angry, $F(1,33)=7.17$, $p<.01$; and happy/sad, $F(1,33)=8.36$, $p<.01$. Current self-mutilation participants also reported significantly higher levels of negative feeling that the recovered group at stage 2 for happy/sad, $F(1,33)=5.50$, $p<.05$. Of particular note is the result that current self-mutilation participants reported significantly lower levels of negative feeling at stage 3 of the self-mutilation script than the recovered participants for relaxed/tense, $F(1,33)=8.83$, $p<.01$; relaxed/anxious, $F(1,33)=12.65$, $p<.001$; calm/angry, $F(1,33)=5.05$, $p<.01$; and relieved/uptight, $F(1,33)=5.91$, $p<.05$.

Figure 3 depicts the different subjective response patterns of the current and recovered groups to self-mutilation imagery for the VAS measure relaxed/tense.

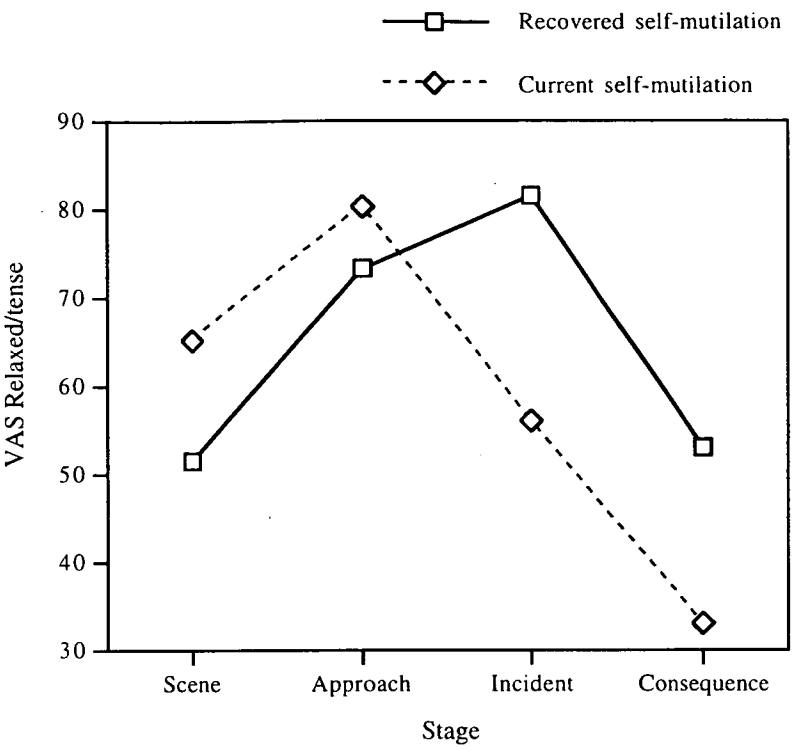

Figure 3. Comparison between current and recovered groups' subjective response to self-mutilation imagery for the VAS measure relaxed/tense

It was of particular interest that for the recovered group, reported negative feelings did not decrease significantly until stage 4, when the consequences of self-injury were imaged, relaxed/tense, $F(1,3)=18.83$; $p<.001$; relaxed/anxious, $F(1,3)=22.37$, $p<.001$; calm/angry, $F(1,3)=17.00$, $p<.001$; and uptight/relieved, $F(1,3)=13.38$, $p<.001$. However, for current self-mutilation participants, reported negative feelings decreased significantly during stage 3 for relaxed/tense, $F(1,3)=6.94$, $p<.01$; relaxed/anxious, $F(1,3)=5.98$, $p<.01$; calm/angry, $F(1,3)=15.07$, $p<.001$; unafraid/afraid, $F(1,3)=5.64$, $p<.05$; and relieved/uptight, $F(1,3)=12.76$, $p<.001$. These feelings continued to decrease at stage 4. This continued decrease was significant for relaxed/tense, $F(1,3)=6.23$, $p<.05$.

2.3. DISCUSSION

Results of this study have indicated that the tension reduction pattern to self-mutilation imagery that has been previously identified in an incarcerated sample of self-mutilators is generalisable to a broader population of individuals who self-mutilate. Initial analyses replicated the lag between the reduction of psychophysiological arousal and psychological distress that has been demonstrated previously (Haines et al., 1995). These results suggested that it is the reduction in psychophysiological arousal that serves to reinforce the behaviour rather than the emotional response to the act.

Comparisons between the responses of self-mutilation participants who were currently self-mutilating and a recovered self-mutilation group were conducted initially to determine the efficacy of a guided imagery methodology in charting the processes of a behaviour in which a person is no longer engaging. These results have clarified the reinforcement qualities of self-mutilation.

For those participants who had not engaged in the behaviour for more than six months, the previously described lag between the reduction of psychophysiological arousal and psychological tension was demonstrated. That is,

the recovered group did not report a reduction in negative feeling until the consequence stage of imagery, after cutting was imaged. However, for those who were currently engaging in the behaviour, the act of self-mutilation was immediately psychophysiologically and psychologically reinforcing.

The results of this study have clarified the reinforcement qualities of the self-mutilative act. For those who are currently engaging in the behaviour, an appropriate cognitive interpretation of the psychophysiological state that self-injury provides is evident. However, results have indicated that the feelings associated with the act of self-injury are cognitively reinterpreted when self-mutilation is no longer part of an individuals' behavioural repertoire. But the psychophysiological reinforcement properties of the self-mutilative act remain the same.

Because the reinforcement qualities of self-mutilation are so strong, it is unlikely that individuals stop self-mutilating because the behaviour no longer works to reduce tension. It is more likely that an alteration in symptomatology leads to a reduced need to engage in the behaviour. Working on this premise, an examination of the symptomatology currently reported by the current and recovered self-mutilation groups was completed.

3. EXPERIMENT 2

The phenomenology of self-mutilation has been well documented (e.g., Haines et al., 1995; Simpson, 1975). Reports have indicated that the feelings that precede self-mutilation typically include depression, anger and increasing intolerable tension or anxiety (Simpson, 1975). As this distress continues to escalate, transition into a state of depersonalisation may occur (Feldman, 1988; Simpson, 1975; Winchel & Stanley, 1991). It has been suggested that in this depersonalised state individuals experience a marked decrease in impulse control and are unable to resist the urge to self-mutilate (Pattison & Kahan, 1983; Waltzer, 1968). It has also been suggested that it is this depersonalised state that allows painless self-injury (Simpson, 1976). With the sight of blood, repersonalisation occurs and tension is reduced (Haines et al., 1995; Simpson, 1976).

Research has indicated that the quality of mood that precedes self-mutilative behaviour is not qualitatively different from the individuals' long standing affective traits (Simeon, Stanley, Frances, Mann, Winchel & Stanley, 1992). The aim of the current study was to clarify the association of the phenomenology of the self-mutilative act with the long standing affective traits associated with the behaviour.

Most of the research concerned with the symptomatology associated with self-mutilation has been conducted with psychiatric inpatient populations using psychiatric control groups as a comparison. Researchers have interpreted self-mutilation as a marker of severity of particular disorders (Simeon, Stanley et al., 1992). It follows from this view that self-mutilative behaviour would cease if the symptoms associated with the disorder were effectively treated.

This investigation systematically compared the symptoms currently experienced by individuals who were presently self-mutilating with those who were no longer engaging in the behaviour. It was expected that recovered self-mutilation participants would report lower levels of symptomatology than those who were currently self-mutilating.

3.1. METHOD

3.1.1. Participants

Twenty one individuals who were currently self-mutilating and 25 individuals who had not self-mutilated for more than 6 months participated in this

investigation. Participants were recruited from community clinics, private psychological practice and the University of Tasmania undergraduate population.

3.1.2. Materials

The following scales were selected to measure the symptomatology that has been reported to be associated with the phenomenology of self-mutilation: The Symptom Check List 90 Revised (SCL-90-R; Derogatis, 1983), the Beck Hopelessness Scale (BHS; Beck & Steer, 1988), the Beck Anxiety Inventory (BAI, Beck & Steer, 1990), the Beck Depression Inventory (BDI; Beck & Steer, 1987), the State Trait Anxiety Inventory (STAI, Form Y; Spielberger, 1983), the Dissociative Experiences Scale (DES, Bernstein & Putnam, 1986), the Hostility and Direction of Hostility Questionnaire (HDHQ; Caine, Foulds & Hope, 1967) and the Eysenck Impulsiveness Questionnaire (Eysenck &McGurk, 1980).

A self-mutilative behaviour checklist devised by the authors was used to determine history of self-mutilation as well as history of help-seeking behaviour and medication. The Schedule of Recent Experience (Holmes, 1988) was used to determine the degree of recent negative life events.

The Reasons for Living Inventory (RFL-48; Linehan, Goodstein, Nielsen & Chiles, 1983) and the Modified Scale for Suicidal Ideation (MSSI; Miller, Norman, Bishop & Dow, 1986) were included to measure suicidal thoughts and coping ideas related to suicide because, although self-mutilation is typically not a suicidal act, individuals who self-mutilate do attempt suicide and have reported feelings of suicidal ideation and hopelessness (Walsh & Rosen, 1988; Favazza & Conterio, 1989).

3.1.3. Procedure

The self-mutilative behaviours checklist was completed during an interview with participants. In addition, current and recovered self-mutilation participants were asked to complete other scales with regard to degree of symptomatology they were currently experiencing.

3.2. RESULTS

3.2.1 Description of sample

The total sample of participants had deliberately injured themselves a median of 32 times (range = 1 . 350) over a mean period of 60.4 months (SD = 75.73 months, range = 2 weeks to 30 years). Cutting was the most frequently reported method of self-mutilation (93.5%). Participants also had hit objects (60.9%), engaged in self-burning (39.1%), wound excoriation (26.1%), skin abrading (21.7%), self-hitting (21.7%), inserting objects under the skin (19.6%), self-biting (8.7%), and ingesting solid objects (2.2%). There were no significant differences between the current and recovered self-mutilation groups in the types of injuries inflicted, or the duration of self-mutilative behaviour.

One significant difference between current and recovered self-mutilation participants was noted for reported frequency of self-mutilative behaviour. Results depicted a significantly higher frequency of self-biting for the current group (t = 48.5, df = 2, $p < .001$). Current self-mutilation participants had bitten themselves a mean of 100 times (SD = 0) and the recovered self-mutilation group reported a mean of 3 incidents of self-biting (SD = 2.83). Inspection of the raw data indicated that this result was due to one currently self-mutilating participant who habitually bit his fingers and finger-nails until they bled.

The majority of self-mutilation participants had never sought help for coping with or modifying their self-mutilative behaviour (71.7%). Those that did seek help (28.3%) did not do so until a mean of 31.6 months after the initial episode of self-mutilation (SD = 65.11, range = 0, i.e., within hours of the initial self-mutilation episode, to 19 years). There was no significant difference in help seeking behaviour between the current and recovered self-mutilation groups.

Of the total number of participants, 34.8% reported currently taking medication, most commonly selective serotonin reuptake inhibiting antidepressants (37.5%), monoamine oxidase inhibitors (31.3%) and antianxiety agents (25.0%). No significant differences between current and recovered self-mutilation participants were evident with regard to current medication.

3.2.2. Symptomatology

Results indicated that the current and recovered self-mutilation groups barely differed with regards to the level of symptomatology they were currently experiencing. Mean and standard deviations for both groups for all scales are available on request. No significant differences between current and recovered self-mutilation participants were evident for the BHS, BAI, BDI or the STAI. Scores for both groups on these measures were within the mild to moderate ranges of symptom severity. No significant difference between current and recovered self-mutilation participants was evident for dissociative experiences as measured by the DES. Both groups indicated substantially higher levels of dissociative experiences that the median score for normal subjects in the original sample (Burnstein & Putnam, 1986). In addition, no significant difference between current and recovered groups was demonstrated for the Eysenck Impulsiveness Questionnaire. No difference between the groups in terms of negative life events as measured by the Schedule of Recent Experience was noted. Both groups reported a high number of recent life events. No between group differences for the MSSI were noted. In fact, extremely low scores for both groups were noted for this measure indicating suicidal ideation was minimal for both groups.

Figure 4 depicts current and recovered groups' responses for the sub scales and global scales for the SCL-90-R.

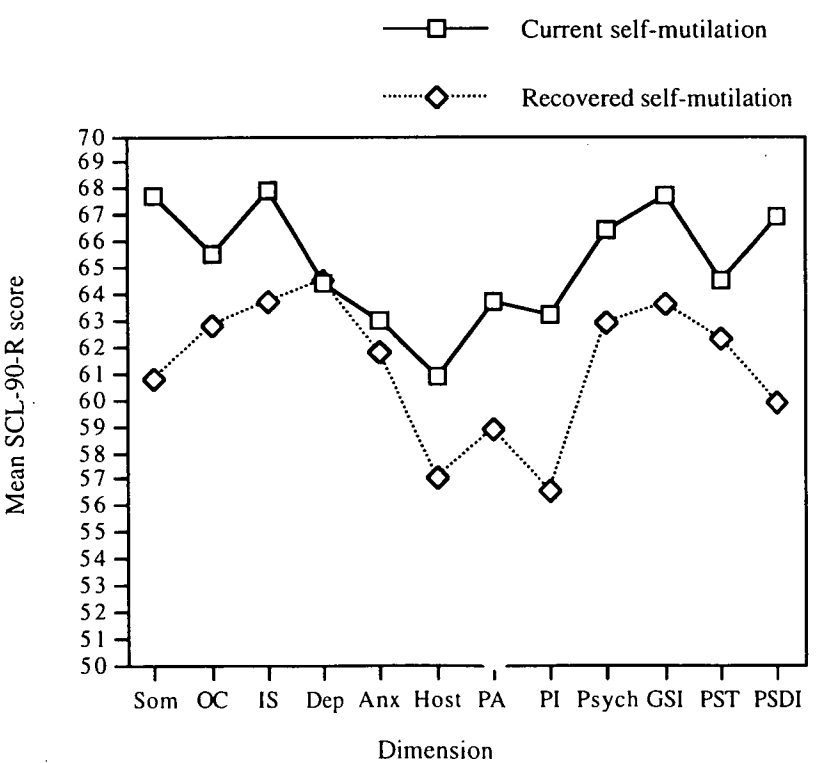

Figure 4. Current and recovered groups' scores for the subscales and global indices of the SCL-90-R

No significant differences between the groups were evident for any of the SCL-90-R subscales. Mean scores for the Obsessive-Compulsive, Interpersonal Sensitivity, Depression and Psychoticism subscales reached clinical significance as

defined by Derogatis (1983) for both groups. Mean scores for Phobic Anxiety and Paranoid Ideation were above the cut off for caseness for the current self-mutilation group only but these scores did not differ significantly from the mean scores of the recovered group on these measures. No significant difference between groups was evident for the Global Severity Index (GSI) or the Positive Symptom Total (PST) for the SCL-90-R. The GSI for both the current and recovered groups was indicative of the presence of psychological maladjustment. However, current self-mutilation participants did report significantly higher levels of distress regarding the presence of these symptoms as measure by the Positive Symptom Distress Index (PSDI) (Fisher PLSD = 5.92, $p < .05$) than the recovered group. In addition, mean PSDI reached a level indicating clinical significance for the current self-mutilation group only.

There were a few other factors that distinguished the current and recovered self-mutilation groups. For the HDHQ, current self-mutilation participants reported significantly higher scores for a measure of total hostility (Fisher PLSD = 4.29, $p < .05$) and for the urge to act out hostility subscale (Fisher PLSD = 1.28, $p < .05$). In addition, the current group scored significantly lower than the recovered group for the Survival and Coping Beliefs subscale of the RFL-48 (Fisher PLSD = 0.55, $p < .05$) and the fear of suicide subscale (Fisher PLSD = 0.56, $p < .05$). Lower scores on these subscales are indicative of an inability to generate coping ideas related to suicide and a low fear of suicidal acts.

3.3. DISCUSSION

It was hypothesised that current self-mutilation participants would report significantly higher levels of symptomatology than the recovered group. Results did not support this hypothesis. No significant differences between current and recovered self-mutilation groups were demonstrated for most symptomatology measures. In addition, the level of symptomatology that participants reported was generally of clinical significance. These results have indicated that the recovered self-mutilation group had not necessarily recovered from the symptoms that have been associated with self-mutilative behaviour. It follows that it is possible to effectively treat the symptom of self-mutilation without significantly altering the level of symptomatology a person is experiencing.

Both self-mutilation groups demonstrated elevated scores on the empathy subscale of the Eysenck Impulsiveness Questionnaire. This has indicated that individuals with a history of self-mutilative behaviour may be particularly sensitive in terms of sharing the perceived emotional experiences of others. In fact, self-mutilating individuals have been described as emotionally labile and as having a tendency to overreact to negative experiences (Simpson, 1976; Zweig, Paris & Guzder, 1994).

There were a few factors that distinguished the groups. On the HDHQ, the current group scored significantly higher on the measure of total hostility, in particular the urge to act out hostile feelings. In addition, the current self-mutilation group were significantly less able to generate coping ideas related to suicide and reported feeling significantly less fearful of the suicidal act. Mean scores on these measures have indicated that current self-mutilation participants' attitude to suicide could best be described as ambivalent.

It was of particular interest that although the current and recovered groups did not differ significantly in number of current symptoms or the degree of symptomatology they were presently experiencing, the current group were significantly more distressed regarding the presence of these symptoms. These differences between the groups could not be accounted for by differences in level or type of current medication, help seeking behaviour or number of recent negative life events. In fact, both groups reported recently experiencing a high number of recent negative life events. The factors that alter the level of distress reported by self-mutilating individuals remains unclear.

4. CONCLUSIONS

It is clear from the results of this investigation that people cut themselves because of the reinforcing nature of the reduction in psychophysiological arousal and psychological tension that the act provides. Results also have indicated that the psychophysiological reinforcement that the act provides is maintained even when the individual is no longer engaging in the behaviour. Therefore, it is unlikely that people stop cutting themselves because the behaviour no longer provides the desired relief from tension.

The results of this study have demonstrated that individuals who have recovered from self-mutilative behaviour may not necessarily have resolved the symptoms associated with self-mutilation. However, they may be significantly less distressed regarding the presence of these symptoms than individuals who are currently self-mutilating. The factors that alter this level of distress remain unclear. It seems that self-mutilative behaviour can be effectively controlled without significantly changing the level of symptomatology a person is experiencing. Therefore, the question is not why do individuals cut themselves, but why do they stop.

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The Psychophysiology of Self-Mutilation

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Self-mutilators' psychophysiological and subjective responses during an imaged self-mutilative act were examined. Differences in arousal to 3 imaged control events (neutral, accidental injury, and aggression) were examined between 3 self-mutilation groups (prisoner, prisoner control, and nonprison control). Imagery scripts were presented in 4 stages: scene setting, approach, incident, and consequence. Results indicated a decrease in psychophysiological and subjective response during self-mutilation imagery. No such decrease was evident for nonmutilators who were administered standard self-mutilation imagery. A lag between psychophysiological and psychological response to the self-mutilative act was evident. Responses elicited during self-mutilation imagery were different from those of control imagery. Results indicated that self-mutilative behavior is maintained by its reinforcing tension-reducing qualities.

Self-mutilation (Type 3; Walsh & Rosen, 1988) has been defined as low lethality, socially unacceptable self-injury performed in reaction to psychological crisis. It involves mild to moderate self-injurious behavior such as skin cutting, self-inflicted burns, and wound excoriation. The behavior is a significant and persistent clinical problem. The incidence of self-mutilation has been estimated to be anywhere between 14 per 100,000 population per year (Morgan, Pocock, & Pottle, 1975) and 750 per 100,000 (Favazza & Conterio, 1989). In all probability the true incidence is anywhere between these figures (Walsh & Rosen, 1988). Even the very lowest figure (14 per 100,000) represents a significant clinical problem.

The incidence of self-mutilation among prisoners has been reported as one of the highest of subpopulations investigated (Feldman, 1988; Holley & Arboleda-Florez, 1988; Simpson, 1976; Yaroshevsky, 1975), and the behavior represents a significant problem in the prison system (Johnson, 1978; Jones, 1986; Thorburn, 1984). As many as 50% of prisoners exhibit self-injurious behavior, whereas only 10% pose a serious suicidal risk (Holley & Arboleda-Florez, 1988). However, all acts of self-harm within the prison system are treated as potentially life threatening, and the precautionary measures that are taken represent a substantial drain on prison resources (McCarthy, 1992).

Self-mutilation can be considered an effective, albeit maladaptive coping strategy. This understanding holds for both nonincarcerated (e.g., Walsh & Rosen, 1988) and incarcerated populations (e.g., Johnson, 1978). Indeed, the high rate of self-mutilative behavior in prisons (Feldman, 1988; Holley & Arboleda-Florez, 1988; Jones, 1986) may be explained by the nature of the prison environment, which generally precludes normal coping (Beigel & Russell, 1972; Grassian, 1983; Johnson, 1978; Jones, 1986). It would appear that the high rate of s mutilative behavior in incarcerated populations does not i cate a fundamental difference in this behavior between in cerated and nonincarcerated individuals. Descriptions of self-mutilative behavior of incarcerated populations is virtu identical to that of nonincarcerated populations (e.g., Bac Rita, 1974; Claghorn & Beto, 1967; Dooley, 1990; Jones, 19 Rada & James, 1982).

Of course, the identification of self-mutilation as a cop strategy does not explain the onset of the behavior. Many th ries have been postulated to explain the etiology of self-mut tive behavior. None can adequately explain the adoption of behavior in all cases; indeed, it is most probably produced b variety of experiential and inherent factors operating in com nation. Nevertheless, a more complete understanding of the f tors that maintain self-mutilation would assist in treating behavior.

Self-mutilative behavior often is very difficult for the nonn tilator (or the self-mutilator, for that matter) to understa Physical damage commonly is inflicted in the absence of p and appears to bring relief for the self-mutilator (Lion & Co 1982). Even the most diverse disciplines have described a si ilar pattern of tension relief following self-mutilative behav (e.g., Arons, 1981; Bennun, 1984; Siomopoulos, 1974). The b havior may become more understandable when the act is exa ined (Raine, 1982).

The tension reduction model of self-mutilation postula that self-mutilative behavior relieves the individual of escalati negative emotions and that this relief reinforces the self-muti tive act (Bennun, 1984). An act of self-mutilation typically f lows a sequence of events that has been described as almost s reotyped (Simpson, 1976). The understanding of this sequen of events is drawn from phenomenological and clinical repor

Self-mutilators have reported a range of negative feelings that c cur immediately prior to an act of self-mutilation (Feldman, 19 Gardner & Gardner, 1975; Graff & Mallin, 1967; Grunebaum Klerman, 1967; Rosenthal, Rinzler, Wallsh, & Klausner, 19 Simpson, 1976). Many factors have been reported to precipit these feelings; interpersonal conflict, rejection, separation, or ab

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donment are the most common (Feldman, 1988; Grunebaum & Klerman, 1967; Novotny, 1972; Rosenthal et al., 1972; Simpson, 1975, 1976). These circumstances may be threatened, real, or imagined (Novotny, 1972). As the behavior becomes habitual, self-mutilative episodes may be precipitated by minor events (Graff & Mallin, 1967).

As the escalating negative feelings become intolerable, many self-mutilators report feeling numb, withdrawn, and unreal (Feldman, 1988; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Rosenthal et al., 1972; Simpson, 1975; Winchel & Stanley, 1991). These feelings indicate a state of depersonalization (Feldman, 1988; Gardner & Gardner, 1975; Pao, 1969; Rosenthal et al., 1972; Simpson, 1976). As the negative feelings become intolerable, the self-mutilator engages in self-injury. Physical damage may range from a single deep laceration to multiple superficial cutting requiring little medical attention (Rosenthal et al., 1972).

Cutting typically occurs in the absence of painful sensation (Gardner & Gardner, 1975; Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Rosenthal et al., 1972; Ross & McKay, 1979; Simpson, 1976; Walsh & Rosen, 1988). This absence of pain is reported even though attempts to desensitize or anaesthetize the skin are rarely made (Ross & McKay, 1979) and injuries often are severe (van Moffaert, 1990). Painful sensation commonly returns minutes, hours, or even days after the injury (Gardner & Gardner, 1975; McKerracher, Loughnane, & Watson, 1968). The absence of pain during self-mutilation most probably is mediated by an increase in endogenous opiates such as β-endorphins and encephalins, caused by the extreme stress reaction prior to cutting (e.g., Darche, 1990).

The sight of blood appears to have significance in the self-mutilative process and precipitates a change in mood (Feldman, 1988; Simpson, 1975). The appearance of blood in the wound results in a sense of relief (van Moffaert, 1990). When instant relief is not felt it is generally related to insufficient bleeding, and some mutilators will continue to cut until there is enough blood to facilitate this change in mood (Kaplan & Fik, 1977; Simpson, 1976).

The act of self-cutting is effectively therapeutic (Simpson, 1976). There is a reported rapid reduction of tension following the commission of the act, and repersonalization occurs for those who previously experienced a depersonalized state (Graff & Mallin, 1967; Grunebaum & Klerman, 1967; Lion & Conn, 1982; Pao, 1969; Rosenthal et al., 1972; Simpson, 1976; van Moffaert, 1990). An act of self-mutilation is terminated when satisfaction and relief are experienced and indeed, most self-mutilators seem to be aware of what is necessary to end the negative emotional state (Rosenthal et al., 1972). Once the cycle is completed, self-mutilators appear quite normal (Graff & Mallin, 1967) and can function adequately (Walsh & Rosen, 1988).

A tension-reducing quality of self-mutilation has been postulated to be the factor that maintains it (Bennun, 1984), even though the reduction of tension that occurs with the act of self-mutilation is typically short-lived (Lion & Conn, 1982). An act of self-mutilation does not alter the underlying psychopathology (Favazza & Conterio, 1989); rather, it temporarily defuses the uncomfortable feelings associated with that psychopathology (Schwartz, Cohen, Hoffman, & Meeks, 1989). When distress is again experienced, the self-mutilator will again engage in self-injury in an attempt to relieve those symptoms (Bennun, 1984; Favazza & Conterio, 1989; Williams & Hart, in press).

Control of self-mutilative behavior only can be gained through an understanding of the processes involved and the factors encouraging the existence and maintenance of the behavior. To date, support for the tension reduction model comes from clinical and phenomenological reports. It is necessary to test the model. Clearly, it is not possible to measure psychophysiological arousal during an actual self-mutilative episode. It is proposed that the use of guided imagery of previous experiences of the self-mutilative act may tap the psychophysiological processes underlying the behavior.

Psychophysiological responses to an image or memory of an event have been demonstrated to simulate responses experienced during the actual execution of the act (Lang, 1979). Furthermore, the content of guided imagery has been demonstrated to affect the psychophysiological response. Guided imagery emphasizing an active response to the event resulted in greater psychophysiological activity than imagery scripts that concentrated solely on stimulus detail (Hirota & Hirai, 1986; Lang, Kozak, Miller, Levin, & McLean, 1980). The efferent pattern of "response" imagery more closely followed script content (Lang et al., 1980). In addition, personally relevant imagery was demonstrated to be superior to standard imagery in the ability to elicit realistic psychophysiological responses (Pitman et al., 1987) and has been used to distinguish individuals with posttraumatic stress disorder from those with anxiety disorders (Pitman et al., 1990).

The use of personalized imagery scripts in eliciting psychophysiological arousal was further developed in the successful insanity defence of a young woman charged with fillicide (*R. v. Horton*, 1986). Imagery depicting episodes of punitive interaction between this mother and her 3-year-old child were divided into four stages: setting the scene, approach to the behavior, actual incident, and consequence or resolution of the punitive interaction. It was of some significance to the outcome of this case that there was a decrease in arousal during the third and fourth stages of imagery. This young woman displayed a substantial reduction in tension during the incident stage of the punishment script. During this stage she was asked to recall and was guided through episodes of punishment where she had hit her child and threatened to kill him. The reduction of tension at this and the subsequent stage was postulated to have reinforced her escalating punitive behavior. The court accepted that this vulnerable young woman's behavior had been shaped to the point where a tragic outcome was inevitable.

This was the first time that guided imagery was used to break down the components of a single behavior into distinct stages. The methodology used in this case was then applied to the investigation of arousal patterns during punitive and nonpunitive parent–child interactions with parents of high and low potential for physical abuse (Williams, Wilson, Montgomery, & Batik, 1989). Progression through stages allowed a gradual and realistic increase in the intensity of the emotional responses. It was recognized that this methodology could be applied to a variety of psychological disorders and symptoms.

Using this methodology, psychophysiological arousal patterns associated with the self-mutilative process and the tension reduction model would appear to be amenable to testing. Response patterns can be hypothesized. The model indicates that

psychophysiological arousal should increase steadily during the first two stages of imagery. During the incident stage of imagery, where actual self-injury is described, arousal should rapidly decrease as an immediate reduction in tension is recalled. This low level of arousal should continue through the final stage of imagery.

The arousal patterns of an actual episode of cutting would be predicted to be quite different to those of other imaged events. No significant variation in arousal across stages would be expected during neutral imagery (e.g., making a cup of coffee). It is likely that during accidental injury imagery, arousal should remain low through Stages 1 and 2, increasing at the incident stage with the shock of injury and remaining high throughout the consequence stage. Description of a stressful event (e.g., an aggressive interaction with another person) should elicit a steady increase in arousal throughout the first three stages of imagery, culminating in the incident stage, and remaining high throughout Stage 4 (Williams et al., 1989).

In this study, we investigate patterns of psychophysiological arousal related to the self-mutilative act. Self-mutilation arousal patterns are compared with those elicited during control scenes using the four-stage methodology (Williams et al., 1989), using a combination of response and stimulus imagery (Lang, 1979; Lang et al., 1980) determined by the information provided by the individual. Whereas it is anticipated that psychophysiological arousal to an episode of self-mutilation will vary from control scenes, there is no evidence to suggest that self-mutilators will react differently to control group participants to the control scenes. Psychological indexes related to the tension reduction model also are examined.

Experiment 1

Method

Participants

Thirty-eight men participated in this study. They were divided into three groups: (maximum security prison inmates) self-mutilators (n = 15), whose self-injurious behavior as rated on the Suicidal Intent Scale (Pierce, 1977) was found to be low for both risk of death and intent to die; nonmutilating (maximum security prison inmates) controls (n = 11); and nonprisoner controls (n = 12), undergraduate university students with no history of self-mutilation or criminal incarceration. Written informed consent was obtained after the nature of this study was fully explained to the participants.

Groups were matched for imagery ability and age, because psychophysiological response has been found to alter as a function of age (Arena, Blanchard, Andrasik, & Myers, 1983). The mean age of the self-mutilators was 21.3 years (SD = 5.1), that of the prisoner nonmutilators was 22.3 years (SD = 5.9), and that of the normal controls was 21.6 years (SD = 4.9). The three groups did not significantly differ in age, $F(2, 37) = 0.10$, $p > .05$. Prisoners were matched for sentence duration, because psychiatric symptomatology alters as a function of length of incarceration (Coid, 1984). It was not deemed necessary to match groups for IQ; an extensive search of literature databases demonstrated no evidence of a relationship between imagery ability and IQ. Consistent with the definition of Type 3 self-mutilation (Walsh & Rosen, 1988), we excluded individuals who were experiencing acute psychotic symptoms and those who were intellectually disabled. Screening for these variables was conducted by the forensic staff at the prison.

Materials

Self-report questionnaires were verbally administered to all participants to circumvent potential problems with literacy in the inmate population. This was done as a precautionary measure only and proved to be unnecessary. Nevertheless, it was considered to be a necessary precaution, not because of the intellectual capacity of the prisoner groups, but because of the possibility of poor educational history. The Betts QMI Vividness of Imagery Scale (Sheehan, 1967) and the Gordon Test of Visual Imagery Control (Gordon, 1949) were administered to assess imagery ability. Visual Analogue Scales (VASs; McCormack, Horne, & Sheather, 1988) were used to measure subjective reaction to imagery. VAS ratings represented a subjective score (from 0 to 100) of response to imagery on bipolar dimensions: relaxed–tense, relaxed–anxious, calm–angry, unafraid–afraid, happy–sad, normal–unreal, and relieved–uptight. The dimension of normal–unreal assessed depersonalization. A higher score reflected a more negative experience.

Scripts

Participants were interviewed to collect information for personalized imagery scripts for four separate events. All groups were interviewed regarding the following: (a) neutral event (e.g., making coffee); (b) accidental injury (e.g., accident with a kitchen knife); and (c) aggressive event (e.g., argument with a significant other). Self-mutilators were also interviewed regarding a past self-cutting episode, either the most recent episode or the episode most vividly recalled. They were requested to describe all these events in terms of their environment, their behaviors, and their emotional and physiological reactions. Care was taken during interviews not to ask leading questions. The information collected during interview was time limited to the minutes before the incident, the actual incident, and the minutes following the incident in order to devise a guided imagery script that could provide a continuous sequence of events.

We then composed imagery scripts of a combination of response and stimulus information extracted from the interviews. All scripts were personalized. Only those elements reported by individuals during interview were included in the personalized scripts in the wording used by the participants. In this way, participants were not directed to experience reactions not previously recalled. In addition, we did not conduct any response imagery training. We divided each imagery script into four distinct stages: setting the scene (a description of the environment and behaviors at the onset of the event); the approach to the behavior (a description of the events leading up to the incident and the reactions to those events); the actual incident (a description of the behaviors and reactions associated with the actual event); and the consequence of the event (a description of the reactions to the event and the specific behaviors performed after the incident). Self-mutilators were administered all scripts. Other groups received only Scripts 1, 2, and 3. (Guidelines for the construction of imagery scripts are available by request from Christopher L. Williams.)

Apparatus and Psychophysiological Recording

Psychophysiological measures included finger blood volume (FBV), finger pulse amplitude (FPA), heart rate (HR), maximum cardiotachometer (CMAX), minimum cardiotachometer (CMIN), respiration (RESP), and skin resistance level (SRL). The cardiotachometer provides a display of phasic heart rate by measuring the time interval between the last two beats of the heart and converting that figure to a rate in beats per minute (Stern, Ray, & Davis, 1980). In this way, CMAX is a measure of maximum HR in beats per minute during the scoring period, and CMIN is a measure of minimum HR in beats per minute during the scoring period.

Measurements were recorded using an 8-channel Dynograph re-

corder with a paper speed of 2.5 mm/s. FBV and FPA were recorded using a Grass photoelectric finger plethysmograph attached to the middle finger of the participant's nondominant hand. The time constant for the plethysmograph recording was .3. HR measures were extracted from the FPA record. (Because of the manual scoring procedure, it was more efficient to extract the heart rate from the FPA record.) Cardiotachometer was recorded using miniature Gereonics Ag/AgCl electrodes fitting at the second rib on both sides of the torso. An electrode placed on the left mastoid process was used as an earth reference. RESP was measured using a Vitalog Respiration Sensor band fitted around the upper torso, mediated by a Vitalog Respiration Amplifer. SRL was measured by two Med Associate 10-mm Ag/AgCl cup electrodes connected to the fingertips of the first and third fingers of the nondominant hand. The 10-mm diameter of the electrode represented electrode paste (ECI Electro-Gel) contact with the skin. FBV, FPA, and SRL measures were taken using the nondominant hand because anxiety reportedly reflects activation in the nondominant hemisphere of the brain (Brende, 1982).

Procedure

Script interviews were conducted in the laboratory to familiarize participants with surroundings and equipment. At the recording session, electrodes were applied, and participants were instructed to sit quietly and calmly while initial recordings were made. Each step in this process was explained to participants before it occurred. Participants were then informed that a number of imagery scripts would be administered on the basis of the information presented at interview, that the information had been divided into four stages, that each stage would last for approximately 1 min, and that instructions to close their eyes and to open their eyes and to switch off the scene would be included. They were instructed to listen carefully to the information presented and to picture the material as clearly as possible. Recordings included 30 s of pre-imagery baseline. The baseline period was recorded with eyes open.

Each stage of each script was approximately 60 s long. Each script had a 10-s pause between stages during which the participants were permitted to open their eyes. The between-stage pause was brief to allow continuity of script content. The timing of the administration of scripts was comparable for all groups. Scripts were administered in a counterbalanced order to overcome problems of adaptation–habituation. Following the presentation of each script type, participants were instructed to complete VASs rating their subjective responses to each stage of the previously presented script. To facilitate this rating, key elements in each script stage were repeated prior to ratings for that stage. At the conclusion of the experiment, each participant was debriefed.

Data Transformation and Scoring

Scores were extracted for a 30-s period of each stage of each script. As scripts were personalized, scoring periods represented the part of each stage containing the most relevant information for that individual. Most commonly this period occurred approximately 15–20 s into each script stage.

Three classes of psychophysiological data were considered. Single measures of CMAX and CMIN were not transformed. Average data (HR, RESP, SRL) represented mean level of psychophysiological response during each scoring period. SRL scores were transformed to skin conductance levels (SCL), the preferred measure of arousal (Andreassi, 1989). Change scores were used for FBV and FPA. Absolute measures on these variables have little applicability when comparing arousal responses between participants and between scripts. Change data examine degree of reactivity to script stages by calculating the difference between prestimulus baseline scores and average response scores elicited throughout each script stage. Change scores were calculated so that the direction of change was consistent with other measures. For FPA, the amplitude of each pulse during the scoring period was measured in millimeters, and these measurements were averaged over the scoring period. The differences between baseline and each script stage then were divided by the baseline score to control for baseline differences between participants. Raw scores for SRL and FBV were calculated for each second and averaged over the 30-s period. FBV scores were then converted to change scores.

A significance criterion of .05 was adopted for all analyses, and a Huynh-Feldt correction was applied to the analyses of variance (ANOVAs). All analyses were two-tailed. Cardiac measures of one self-mutilating participant could not be scored because of cardiac arrhythmia.

Initially, we conducted Group (self-mutilator, nonmutilator, normal control) × Script (neutral, accidental injury, aggression) × Stage (scene setting, approach, incident, consequence) ANOVAs for each of the psychophysiological and subjective dependent variables to determine whether differences existed. The main aim of these analyses was to determine whether self-mutilators responded in an abnormal or aberrant manner to life events also experienced by other groups. We also used a within-group design to test the tension reduction model. In this design, Script (self-mutilation, neutral, accidental injury, aggression) × Stage (scene setting, approach, incident, consequence) ANOVAs were conducted. Whereas the number of ANOVAs was excessive, the ratio of participants to dependent variables prevented the use of multivariate ANOVAs (Tabachnick & Fidell, 1989). Fisher least significant difference and Bonferroni–Dunn post hoc comparisons were made.

Results

History of Self-Mutilation

Participants deliberately injured themselves a median of 18 times (range = 1–500). Whereas the highest figure was only an estimate and seems exceedingly high, the complex network of scarring provided convincing evidence that the estimate was realistic. The last self-mutilative act occurred a mean of 5.2 months prior to interview (SD = 4.8; range = 0, i.e., within the last month before interview, to 13 months). The mean duration of self-mutilative behavior was 5.9 years (SD = 5.3; range = 0 years, i.e., under 1 year, to 22 years). All but two of the self-mutilators had deliberately injured themselves prior to incarceration, which suggests that, in this sample, the behavior is not the product of institutionalization.

All participants cut themselves. To a lesser extent, they had used self-burning (7%), skin scratching (7%), hitting (47%), and interfering with the healing of wounds (13%) as methods of self-mutilation. The forearms (including wrists) were the most common site of injury (93%). Other sites of injury included upper arm (40%), lower leg (20%), upper leg (27%), torso and neck (33%), and face (33%). All participants used a razor to inflict injury, 47% used a knife, 53% used broken glass, and 47% used other instruments (including wood, soda cans, and fingernails).

Response to Imagery

The means and standard deviations of the psychophysiological responses of all groups to each stage of the scripts are presented in Table 1, and the subjective responses are presented in Table 2. The Huynh-Feldt correction factors ranged from .3 to .9.

It was important to establish that self-mutilators did not demonstrate aberrant arousal patterns to all imaged situations.

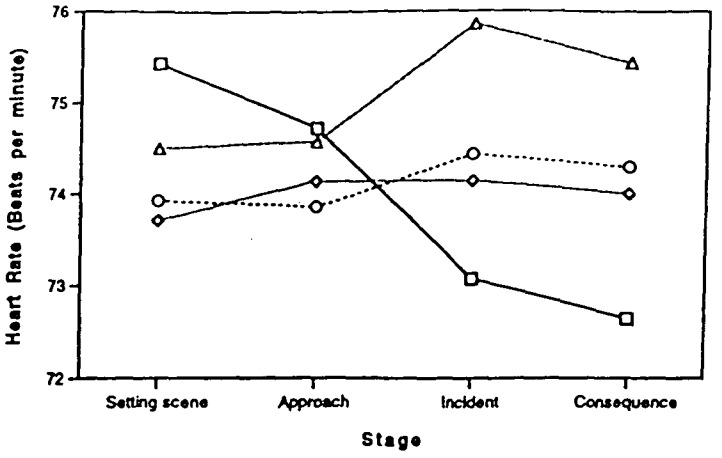

Figure 1. Variation in psychophysiological response for heart rate for each stage of each script for the self-mutilation group. (Squares represent the self-mutilation script; diamonds represent the neutral script; circles represent the injury script; and triangles represent the aggression script.)

Whereas no differences were predicted between groups on the control events (neutral, injury, and aggression), a significant between-group difference was demonstrated in psychophysiological arousal for FPA, $F(2, 32) = 9.67$, $p < .001$. Post hoc tests using Bonferroni–Dunn comparisons demonstrated that prisoner controls had lower levels of arousal to neutral imagery than self-mutilators (Bonferroni–Dunn, $p < .02$) and nonmutilator controls (Bonferroni–Dunn, $p < .001$). Nonprisoner controls were significantly more aroused than self-mutilators to injury imagery (Bonferroni–Dunn, $p < .01$). The prisoner controls did not differ from the other two groups. No other differences in psychophysiological arousal between groups were evident. No significant between-group differences were found in subjective response to neutral, injury, and aggression scripts. These results indicate that the psychophysiological and psychological responses of self-mutilators to control scripts did not substantially differ from the control groups.

Self-Mutilation Group

Comparison of psychophysiological response between scripts. For the self-mutilators, a comparison was initially made between responses to self-mutilation imagery and control imagery. Within-group ANOVAs performed on self-mutilators' data investigating between-script differences in psychophysiological arousal demonstrated significant Script × Stage interactions for two of the seven psychophysiological measures: HR, $F(9, 13) = 2.09$, $p < .05$, and SCL, $F(9, 14) = 3.41$, $p < .03$. A trend toward significance was noted for FBV, $F(9, 14) = 2.10$, $p < .09$. Post hoc tests demonstrated significant differences for SCL between Stage 2 of the self-mutilation script and Stage 2 of neutral, injury, and aggression scripts, $F(1, 14) = 30.26$, $p < .001$. Significant differences between Stage 3 of the self-mutilation script and Stage 3 of the remaining scripts were demonstrated for FBV, $F(1, 14) = 21.99$, $p < .001$, and HR, $F(1, 13) = 6.39$, $p < .02$. Differences in Stage 4 of the self-mutilation script and other scripts were also significant for FBV, $F(1, 14) = 37.00$, $p < .001$, and HR, $F(1, 13) = 7.87$, $p < .01$. Figure 1 provides an example of the differing arousal patterns between scripts to mean HR.

VAS data. ANOVAs performed on VAS data demonstrated significant differences in subjective experience between scripts on all measures: Relaxed–tense, $F(3, 14) = 20.37$, $p < .001$; relaxed–anxious, $F(3, 14) = 16.29$, $p < .001$; calm–angry, $F(3, 14) = 24.46$, $p < .001$; unafraid–afraid, $F(3, 14) = 6.60$, $p < .002$; happy–sad, $F(3, 14) = 9.64$, $p < .001$; normal–unreal, $F(3, 14) = 21.11$, $p < .001$; and relieved–uptight, $F(3, 14) = 10.00$, $p < .001$. The neutral script was experienced significantly more positively than all other scripts on all measures: relaxed–tense, $F(1, 14) = 55.41$, $p < .001$; relaxed–anxious, $F(1, 14) = 46.30$, $p < .001$; calm–angry, $F(1, 14) = 53.60$, $p < .001$; unafraid–afraid, $F(1, 14) = 13.75$, $p < .003$; happy–sad, $F(1, 14) = 13.75$, $p < .001$; normal–unreal, $F(1, 14) = 10.69$, $p < .001$; and relieved–uptight, $F(1, 14) = 22.61$, $p < .001$. Significant differences between the self-mutilation script and the neutral, injury, and aggression scripts were also detected on all measures: relaxed–tense, $F(1, 14) = 9.93$, $p < .004$; relaxed–anxious, $F(1, 14) = 10.14$, $p < .003$; calm–angry, $F(1, 14) = 12.20$, $p < .002$; unafraid–afraid, $F(1, 14) = 10.26$, $p < .003$; happy–sad, $F(1, 14) = 24.66$, $p < .001$; normal–unreal, $F(1, 14) = 32.57$, $p < .001$; and relieved–uptight, $F(1, 14) = 4.50$, $p < .04$. Significant Script × Stage interactions were evident for all measures: relaxed–tense, $F(9, 14) = 4.67$, $p < .001$; relaxed–anxious, $F(9, 14) = 3.42$, $p < .005$; calm–angry, $F(9, 14) = 5.56$, $p < .001$; unafraid–afraid, $F(9, 14) = 4.28$, $p < .001$; happy–sad, $F(9, 14) = 5.97$, $p < .001$; normal–unreal, $F(9, 14) = 4.07$, $p < .001$; and relieved–uptight, $F(9, 14) = 3.52$, $p < .001$. Figures 2 and 3 illustrate the response variation

(*text continues on page 480*)

Table 1
Means and Standard Deviations on the Psychophysiological Measures for Each Stage of the Four Scripts for All Groups

	Self-mutilation				Neutral				Accidental injury				Aggression			
Group	Scene	Appr.	Incid.	Cons.	Scene	Appr.	Incid.	Cons.	Scene	Appr.	Incid.	Cons.	Scene	Appr.	Incid.	Cons.
								FBV								
S–M																
M	−1.13	−1.24	−2.92	−3.68	−0.49	−0.51	−0.83	−0.70	−0.30	−0.24	−0.06	−0.04	−0.08	−0.77	0.12	0.06
SD	2.11	2.84	4.45	4.88	1.08	2.64	3.52	3.31	1.39	2.26	3.89	4.89	1.45	2.69	3.41	3.82
P–C																
M					−0.44	−0.21	−0.45	−0.82	0.00	−0.08	−0.10	0.43	0.06	1.06	0.57	0.59
SD					0.72	1.71	2.28	3.49	1.07	1.44	1.62	2.04	0.78	3.30	3.46	3.92
N–C																
M					0.07	0.07	0.47	0.69	0.17	0.09	−0.15	−0.44	−0.36	−0.57	−1.50	−1.71
SD					1.18	2.17	2.14	2.72	0.78	2.04	2.71	2.67	1.01	1.82	4.42	4.10
								FPA								
S–M																
M	0.19	0.17	−0.02	0.03	0.05	−0.03	−0.03	0.01	0.09	−0.04	−0.05	−0.07	0.05	0.13	0.00	−0.07
SD	0.24	0.78	0.65	0.42	0.27	0.33	0.38	0.28	0.17	0.29	0.39	0.33	0.25	0.29	0.38	0.42
P–C																
M					−0.04	−0.30	−0.41	−0.35	0.17	0.15	0.21	0.01	0.24	0.32	0.34	0.27
SD					0.37	0.41	0.40	0.43	0.30	0.31	0.36	0.51	0.27	0.48	0.40	0.41
N–C																
M					0.23	0.16	0.05	0.10	0.22	0.27	0.36	0.20	0.25	0.37	0.33	0.28
SD					0.10	0.14	0.31	0.30	0.18	0.20	0.21	0.28	0.19	0.20	0.24	0.28
								HR								
S–M																
M	75.43	74.71	73.07	72.64	73.71	74.14	74.14	74.00	73.93	73.86	74.43	74.29	74.50	74.57	75.86	75.43
SD	13.66	13.09	13.19	13.22	12.86	11.90	12.71	11.48	11.77	12.71	12.16	11.44	13.04	12.92	14.37	11.59
P–C																
M					71.54	70.36	69.73	69.45	72.18	70.36	71.09	70.64	72.90	70.60	70.00	71.00
SD					8.69	10.98	9.94	9.59	9.94	10.54	9.60	10.45	12.11	8.91	9.52	9.81
N–C																
M					66.50	64.17	66.00	66.25	66.25	65.92	67.75	65.33	68.80	71.30	71.00	69.20
SD					12.99	11.98	12.65	11.44	11.22	11.28	10.50	11.62	11.67	15.42	15.84	13.44
								CMAX								
S–M																
M	84.93	84.36	81.21	82.43	82.57	81.43	82.79	84.00	82.64	82.64	81.86	82.79	83.64	82.64	83.50	83.43
SD	12.64	12.98	13.28	12.49	13.14	11.97	11.06	10.82	10.93	11.91	11.11	11.17	11.72	12.73	13.32	11.95
P–C																
M					83.64	81.18	80.82	80.45	85.27	82.73	83.54	83.64	82.50	84.40	84.50	82.80
SD					12.04	9.81	10.98	10.16	10.74	11.48	9.66	13.58	8.33	12.02	13.25	10.54
N–C																
M					79.67	78.58	78.17	80.50	77.75	79.00	80.33	81.08	82.30	86.10	85.00	84.70
SD					15.86	16.36	15.41	14.27	13.06	14.04	11.50	13.63	13.04	17.60	14.59	16.87

Table 1 (*continued*)

Group	Self-mutilation				Neutral				Accidental injury				Aggression			
	Scene	Appr.	Incid.	Cons.	Scene	Appr.	Incid.	Cons.	Scene	Appr.	Incid.	Cons.	Scene	Appr.	Incid.	Cons.
								CMIN								
S–M																
M	69.71	69.79	68.64	66.79	68.57	68.86	68.57	69.50	68.93	68.14	68.57	68.50	67.86	69.29	68.57	68.07
SD	14.96	15.59	15.36	15.36	14.55	14.70	14.93	14.43	12.95	14.10	13.69	13.24	14.48	13.92	14.84	13.71
P–C																
M					67.18	67.73	67.09	65.09	68.18	68.09	65.91	67.09	65.50	66.80	64.70	65.40
SD					12.59	15.53	12.87	14.26	13.88	14.54	14.41	14.55	13.17	11.41	14.02	13.56
N–C																
M					61.58	59.25	60.75	61.08	62.42	60.33	62.42	62.08	63.40	66.50	67.60	63.90
SD					11.95	10.25	11.69	10.83	10.48	9.02	9.97	12.12	12.05	15.33	15.78	14.97
								RESP								
S–M																
M	18.57	20.23	18.20	18.17	17.67	18.27	17.70	18.50	17.47	17.57	19.27	18.30	17.85	18.63	19.30	18.77
SD	4.58	5.68	5.34	4.36	4.03	3.05	3.87	3.24	5.69	4.66	4.17	3.28	3.77	5.22	4.97	4.46
P–C																
M					15.59	16.82	16.64	15.73	17.00	16.45	18.04	15.82	16.35	16.60	18.80	16.70
SD					4.78	4.26	4.23	4.43	3.63	4.78	6.31	4.17	4.35	5.60	8.01	6.39
N–C																
M					14.50	14.67	14.83	14.42	15.75	15.87	16.75	16.33	14.80	15.10	16.50	14.90
SD					4.74	5.45	4.24	4.23	3.33	4.18	3.74	3.28	4.18	4.46	4.40	4.33
								SCL								
S–M																
M	17.46	18.52	16.21	15.81	17.29	16.22	16.16	16.29	17.40	16.60	16.93	16.99	16.66	16.12	16.23	15.67
SD	8.62	9.85	6.84	6.49	8.42	6.27	6.77	6.72	9.84	8.06	7.77	7.99	7.13	6.74	6.53	6.14
P–C																
M					14.25	14.40	14.66	15.56	16.65	16.08	17.03	17.06	17.47	17.92	18.08	18.15
SD					5.51	5.99	6.89	7.74	9.09	8.87	9.71	9.73	11.56	12.76	12.26	11.91
N–C																
M					13.78	13.58	13.69	13.52	14.45	14.61	15.41	14.82	15.34	15.92	15.90	15.52
SD					5.16	5.39	5.41	5.29	6.44	6.56	6.86	6.52	6.03	5.83	5.87	6.22

Note. Appr. = approach; incid. = incident; cons. = consequence; FBV = finger blood volume (in millivolts); FPA = finger pulse amplitude (in millivolts); HR = heart rate (in beats per minute); CMAX = maximum cardiotachometer (in beats per minute); CMIN = minimum cardiotachometer (in beats per minute); RESP = respiration (in breaths per minute); SCL = skin conductance levels (in microsiemens); S–M = self-multilators; P–C = prison controls; N–C = nonprison controls.

Table 2
Means and Standard Deviations on the Subjective Measures for Each Stage of the Four Scripts for All Groups

Group	Self-mutilation				Neutral				Accidental injury				Aggression			
	Scene	Appr.	Incid.	Cons.	Scene	Appr.	Incid.	Cons.	Scene	Appr.	Incid.	Cons.	Scene	Appr.	Incid.	Cons.
Relaxed–tense																
S–M																
M	70.93	70.53	58.33	38.87	26.47	18.60	12.67	20.93	25.60	49.40	73.20	47.20	49.87	69.40	80.73	51.60
SD	25.86	31.17	31.64	37.02	20.64	19.65	13.10	24.74	22.25	31.68	23.93	33.92	33.74	28.40	25.00	31.26
P–C																
M					10.89	14.67	14.22	18.78	25.33	31.22	67.89	63.11	44.12	75.50	86.50	69.12
SD					7.41	9.38	11.50	17.10	29.91	28.30	24.53	18.28	29.20	34.38	15.45	31.82
N–C																
M					22.08	19.25	21.25	16.83	23.17	34.17	71.58	70.42	52.90	63.60	83.50	67.50
SD					19.44	17.18	17.94	13.81	19.69	25.94	15.93	18.21	35.17	27.47	12.43	21.41
Relaxed–anxious																
S–M																
M	73.53	69.00	66.47	37.80	21.47	30.87	15.60	19.73	36.53	50.13	68.93	52.73	48.00	64.67	70.07	58.73
SD	21.25	29.90	29.37	33.74	15.06	29.38	15.26	17.52	28.66	30.95	22.82	31.38	30.86	28.32	30.95	27.03
P–C																
M					17.33	19.67	18.67	13.44	23.33	44.89	64.11	68.44	49.25	75.50	87.00	70.75
SD					16.19	16.39	24.57	9.64	27.42	27.36	26.43	21.15	32.13	31.72	14.88	31.50
N–C																
M					19.75	18.42	22.75	17.83	27.42	39.58	80.17	73.42	46.40	65.50	78.70	64.80
SD					15.22	15.79	19.82	14.87	24.03	31.85	14.98	17.67	29.99	26.78	15.10	16.83
Calm–angry																
S–M																
M	76.07	70.13	62.73	37.13	19.00	21.00	15.47	22.00	22.00	37.00	60.47	47.20	53.73	73.40	85.00	64.13
SD	27.50	28.23	35.75	33.85	16.88	18.42	14.75	22.33	21.39	34.16	27.36	27.42	39.73	27.59	13.70	30.09
P–C																
M					12.22	12.22	14.89	13.44	19.89	17.00	46.67	50.22	39.75	77.87	89.50	71.00
SD					9.70	8.26	16.03	11.15	19.90	11.34	23.26	25.16	37.68	28.82	12.52	28.08
N–C																
M					17.00	18.50	17.75	17.50	22.67	26.25	61.50	62.25	41.60	62.30	88.40	74.10
SD					15.22	15.47	15.59	14.31	17.18	18.80	14.97	11.95	34.23	28.97	8.50	19.19
Unafraid–afraid																
S–M																
M	47.60	56.60	37.33	38.20	15.13	13.93	14.40	15.87	21.67	27.87	52.20	45.07	21.40	28.87	27.20	32.40
SD	39.10	36.71	38.62	38.28	17.03	15.81	14.99	17.03	17.61	29.59	36.52	36.92	22.03	27.12	32.24	31.27
P–C																
M					9.67	18.44	21.78	19.00	23.44	19.89	56.56	59.22	23.00	39.12	49.75	49.12
SD					7.75	14.32	17.28	14.69	30.05	14.45	32.72	33.94	17.74	29.98	35.64	37.02
N–C																
M					18.50	18.83	21.58	28.58	32.92	38.08	69.83	62.67	35.30	41.10	57.30	51.40
SD					15.27	15.84	17.08	19.04	24.38	25.61	17.22	17.45	33.59	27.33	27.05	24.69

Table 2 (*continued*)

Group	Self-mutilation				Neutral				Accidental injury				Aggression			
	Scene	Appr.	Incid.	Cons.	Scene	Appr.	Incid.	Cons.	Scene	Appr.	Incid.	Cons.	Scene	Appr.	Incid.	Cons.
Happy–sad																
S–M																
M	79.67	76.27	70.20	40.27	23.40	34.47	33.07	31.60	27.53	27.80	48.33	44.73	33.20	46.47	49.47	52.13
SD	19.66	21.28	28.62	31.20	19.98	27.67	28.21	24.50	23.86	21.36	26.29	32.87	28.65	30.99	31.75	28.11
P–C																
M					25.33	22.56	23.44	21.56	25.11	20.89	50.89	54.56	29.12	58.62	65.75	66.62
SD					21.04	19.66	18.76	16.85	23.93	14.66	22.83	22.07	22.26	31.02	29.75	22.76
N–C																
M					30.25	34.83	35.25	34.33	20.83	26.75	65.33	60.58	33.70	56.00	72.70	77.90
SD					21.88	18.48	18.33	18.38	18.02	19.02	14.01	7.61	30.16	30.40	19.03	19.30
Normal–unreal																
S–M																
M	76.47	67.93	69.93	55.93	19.80	16.07	20.13	18.73	32.87	53.00	59.67	42.67	30.40	62.07	69.47	37.73
SD	17.46	26.71	27.44	32.68	18.66	16.54	25.30	19.17	31.10	35.16	32.80	31.47	28.13	27.02	28.18	30.88
P–C																
M					13.33	18.11	23.89	13.00	37.56	34.89	56.56	56.11	41.75	57.00	58.87	60.75
SD					11.46	16.60	23.32	9.22	38.68	25.27	27.02	27.63	28.06	39.03	31.93	31.45
N–C																
M					28.25	24.25	24.92	21.08	20.75	26.75	47.08	40.50	34.90	42.20	44.80	45.40
SD					27.73	22.66	22.09	16.43	16.36	21.95	29.80	28.67	22.31	27.65	26.54	28.30
Relieved–uptight																
S–M																
M	81.73	78.07	40.20	36.07	29.93	33.87	29.60	29.27	40.40	43.20	57.27	46.13	61.67	72.53	75.60	48.80
SD	15.99	15.87	38.54	34.53	30.32	29.31	26.68	23.54	34.27	31.72	34.35	33.06	30.10	29.26	25.80	35.55
P–C																
M					20.89	24.78	26.67	30.44	49.22	46.33	56.22	54.56	59.37	75.25	82.87	64.12
SD					18.99	22.91	21.83	24.70	25.54	25.48	18.22	21.41	32.49	30.92	15.12	33.70
N–C																
M					40.58	42.17	42.00	42.67	42.08	43.83	64.25	50.25	58.00	71.80	86.30	69.20
SD					12.90	8.32	6.97	9.01	16.19	18.49	14.24	27.20	25.88	20.42	8.83	22.99

Note. Appr. = approach; incid. = incident; cons. = consequence; S–M = self-multilators; P–C = prison controls; N–C = nonprison controls.

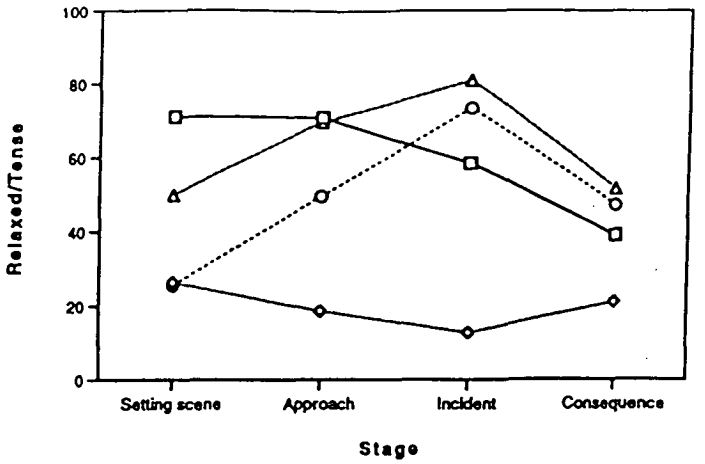

Figure 2. Variation in response to the relaxed–tense measure for each stage of each script for the self-mutilation group. (Squares represent the self-mutilation script; diamonds represent the neutral script; circles represent the injury script; and triangles represent the aggression script.)

across script stages, with comparison between scripts for relaxed–tense and calm–angry.

Psychophysiological response to self-mutilation imagery. Results demonstrated significant across-stage differences for six of the seven psychophysiological arousal measures to the self-mutilation script, supporting the tension reduction model of self-mutilation: FBV, $F(3, 14) = 7.56$, $p < .007$; HR, $F(3, 13) = 5.97$, $p < .005$; CMAX, $F(3, 13) = 3.97$, $p < .02$; CMIN, $F(3, 13) = 3.18$, $p < .05$; RESP, $F(3, 14) = 5.03$, $p < .007$; and SCL, $F(3, 14) = 4.49$, $p < .04$. Post hoc analyses demonstrated that psychophysiological arousal remained high across Stages 1 and 2, significantly decreased at Stage 3 with the act of self-cutting, and remained low throughout Stage 4. The (nonsignificant) measure of FPA displayed the hypothesized pattern of arousal change.

VAS data to self-mutilation imagery. Results from one-way ANOVAs performed on self-mutilation script VAS data provided significant support for the tension reduction model. Significant between-stage differences were evident for five of the seven VAS measures: relaxed–tense, $F(3, 14) = 5.72$, $p < .004$;

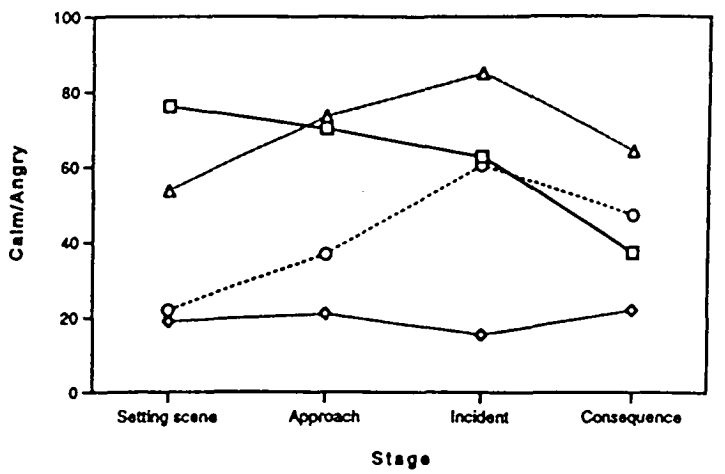

Figure 3. Variation in response to the calm–angry measure for each stage of each script for the self-mutilation group. (Squares represent the self-mutilation script; diamonds represent the neutral script; circles represent the injury script; and triangles represent the aggression script.)

relaxed-anxious, $F(3, 14) = 5.52$, $p < .003$; calm-angry, $F(3, 14) = 6.51$, $p < .001$; happy-sad, $F(3, 14) = 15.28$, $p < .001$; and relieved-uptight, $F(3, 14) = 13.30$, $p < .001$. Post hoc analyses demonstrated that only one VAS, relieved-uptight, mirrored the arousal pattern of the psychophysiological data. For the remainder, the significant decrease in subjective response occurred between Stages 3 and 4.

Between-stage differences for the unafraid–afraid measure were not significant. However, the pattern of subjective experience was consistent with the model. The pattern of response for the normal–unreal measure was not significant, but it did show a decrease across stages, with the greater decrease occurring between Stages 3 and 4.

Discussion

It was predicted that self-mutilators would respond to control imagery in a similar way to control participants. Although there are consistent reports that self-mutilators demonstrate a specific pattern of response to acts of self-injury, there is no evidence in the literature to suggest that they respond aberrantly to all types of events. Indeed, no significant differences were evident between groups in subjective response to control imagery, and no consistent difference was evident in their psychophysiological response. Whereas self-mutilators were significantly more aroused than prisoner controls during neutral imagery, the arousal patterns of the self-mutilators did not significantly differ from nonprisoner controls. In addition, self-mutilators were significantly less aroused than nonprisoner controls to imagery of accidental injury, but the prisoner controls achieved intermediate scores and did not significantly differ from the other two groups. It is likely that self-mutilators do not react as strongly as the other participants to accidental injury because of habituation to physical damage. However, self-mutilators did not demonstrate a tension reduction pattern to accidental injury, and in interviews they reported normal pain reactions to episodes of accidental injury. In contrast, no participant reported pain with episodes of self-mutilation. This point may explain the lack of phasic increase of autonomic nervous system activity with self-inflicted injury, an increase commonly demonstrated with painful sensation.

Whereas results did not demonstrate overall significant differences in the responses of self-mutilators to the different imagery scripts, significant Script × Stage interactions were evident for two of the seven psychophysiological measures, HR and SCL. A trend toward significance was noted for FBV. This lack of convergence between measures of psychophysiological arousal is not uncommon, except in circumstances of intense emotional arousal (Andreassi, 1989). Convergence was found for the majority of measures of psychophysiological arousal to an episode of self-mutilation. The measures HR, CMAX, and CMIN are highly correlated, and other measures (FBV, RESP, and SCL) support the finding.

Participants seemed to be able to distinguish psychological responses to the different scripts. Results indicated that subjective response patterns to imagery generally followed script content. VAS scores on all measures for neutral imagery were typically low, with minimal variation across script stages. During Stage 1 of injury and aggression imagery, responses for all VAS measures were either positive or neutral. In comparison, VAS responses indicated participants were experiencing some psychological distress at that stage of self-mutilation imagery.

Stage 2 subjective responses for the injury script remained comparatively low. For self-mutilation and aggression scripts, responses increased for five of the seven VAS measures at this stage, in accordance with the increase in emotional intensity of the situation. Unafraid–afraid and happy–sad measures were exceptions. Although some variation in the expected patterns across script stages was illustrated, responses did not appear to reach a psychologically distressing level. None of the imaged situations evoked a substantial fear response. Furthermore, it is likely that the happy–sad measure was not a particularly relevant emotional experience for neutral, injury, and aggression scripts. For the self-mutilation script, however, high scores on this measure in the early stages of imagery represent reported depression preceding the self-mutilative act.

An increase in emotional response at Stage 3 was typically evident for both injury and aggression scripts, as incidents described were experienced with an increase in psychological distress. In contrast, a decrease in emotional response was illustrated on all measures at this stage of the self-mutilation script. Reports indicated that emotional response for all VAS measures decreased at Stage 4. This decrease was significant for the self-mutilation script because individuals reported experiencing the consequent relaxation following their self-mutilative behavior.

Results appear to provide support for the tension reduction model. Psychophysiological arousal increased steadily during scene setting and approach behavior and decreased at Stage 3 as the decision to cut and actual self-mutilation were described. This decrease in arousal was significant for the majority of psychophysiological measures. Arousal remained low throughout the final stage of imagery.

The model postulates that the behavior represents a drive reduction mechanism that is maintained by a psychophysiological reinforcement process. Results appear to support this notion. The reduction in psychophysiological arousal that self-mutilation provides may serve to reinforce the behavior as an effective coping strategy. Self-mutilation produces tension reduction and promotes the feelings of relaxation that have been reported as a consequence of the behavior (Favazza & Conterio, 1989; Simpson, 1975).

Psychological responses to self-mutilation varied significantly as a function of script stage on five of the seven VAS measures. Subjective measures duplicated the hypothesized tension reduction pattern. However, this reduction did not reach significance until the final stage of imagery except for the relieved-uptight measure which mirrored the psychophysiological response pattern. Self-mutilators often are unable to provide explanations for their own self-mutilative behavior (Favazza & Conterio, 1989; Simpson, 1976; Walsh & Rosen, 1988). Participants reported continued negative feelings despite reduced psychophysiological arousal. This result suggests that it is the alteration of psychophysiological arousal that may operate to reinforce and maintain the behavior, not the psychological response.

This methodology appears to provide a means of accessing psychophysiological states when direct measurement is impossible because of logistic or ethical reasons. It may prove to be

a useful tool for researchers interested in investigating clinical disorders.

To apply this methodology to clinical populations, a number of factors had to be considered. The literature on imagery has clearly and consistently provided evidence on the factors that enhance the use of guided imagery. First, individuals with good imagery ability are more likely to display a psychophysiological arousal pattern that follows imagery script content. Second, imagery scripts with an emphasis on response elements are superior to scripts containing mainly stimulus elements in eliciting a realistic psychophysiological response pattern (Hirota & Hirai, 1986; Lang et al., 1980). The use of personally relevant material in the script enhances the psychophysiological response of individuals (Pitman et al., 1987, 1990). Finally, the division of an imagery episode into four stages allows for the gradual and realistic buildup of the emotional and psychophysiological response (Williams et al., 1989).

However, the first two of these conditions may be difficult to fulfill when individuals are selected on the basis of membership in a clinical group. For example, it would be expected that individuals with a wide range of imagery ability would be present in any clinical group. In addition, it is a well-established finding in clinical practice that many individuals lack the ability to distinguish changes in psychophysiological arousal and, therefore, could not provide the necessary response elements for inclusion in a response-oriented imagery script.

A pilot study was conducted (Brain, Williams, Stops, & Haines, 1993) to determine whether the methodology would be a viable proposition if applied to individuals who had poor imagery ability and who were unable to supply response elements for script inclusion. Two groups of participants were selected on the basis of their imagery ability. One group had high imagery ability (within the top 25% of imagery scores), and the other low imagery ability (bottom 25%). Both groups were administered a range of guided imagery script types, only one half of which contained response elements. The handicaps of poor imagery ability and no response information were overcome by the use of personalized scripts presented in stages. Therefore, as long as the participants from a clinical group could adequately recall an actual episode of the target behavior, they could participate in a study using this methodology.

However, these findings raised one issue of particular relevance to this study. The design of this experiment did not allow for the inclusion of a script, equivalent to the self-mutilation script, to be administered to the control groups. The results of the pilot study suggested that it would be inappropriate to administer a nonpersonalized or standard self-mutilation script to those individuals who had never experienced the behavior, given that each group included participants with poor imagery ability and that some of the participants in each group were remarkably poor at identifying arousal levels. Any results obtained from the administration of a standardized script, at the very least, would be confounded by the effects of imagery ability.

Whereas certain clinical conditions would allow for a comparable control script to be administered (e.g., bulimia where a control script for bingeing could be overeating), no such control event could be applied to self-mutilative behavior. Indeed, a within-subject design could have been applied to this study, using only self-mutilators and administering the other script types as controls. However, control groups were administered the control scripts to determine whether self-mutilators were aberrant responders, that is, to determine whether they responded in a way dissimilar to the responses of nonmutilators to control scripts. This did not appear to be the case.

It should be noted that the aim of the study was to determine how self-mutilators reacted to an actual episode of self-mutilative behavior and not to determine whether nonmutilators could simulate the response of self-mutilators to the act. To this end, the construction of the scripts was based only on information supplied by the participant. Whereas only some of these individuals in interview were aware of a tension reduction process, the majority of them demonstrated psychophysiological patterns that *may* be considered to be consistent with such a process.

Although the guided imagery method was devised in an attempt to access the memory of a real event, it may be argued that the use of guided imagery produced an experimenter bias to tension reduction during the presentation of self-mutilation imagery scripts. All script types were constructed in an identical manner. If a pull to tension reduction existed for the self-mutilation scripts, then a pull to tension increase would have occurred for the accidental injury and aggression scripts of a similar magnitude as the tension reduction associated with the self-mutilation scripts. Whereas the results demonstrated some increase in tension for the accidental injury and aggression scripts, the changes in response pattern were not as great as for the self-mutilation script. It appeared to be the clarity of memory and the intensity of the emotional response associated by the participant with the act that determined the psychophysiological and subjective responses. However, to clarify this point, it would be necessary to attempt to induce a tension reduction pattern to deliberate self-injury in a nonmutilator group using the four-stage guided imagery methodology. Of course, standard imagery would need to be used, because nonmutilators have no direct experience of deliberate self-injury.

It was decided to administer standard self-mutilation scripts to a group of nonmutilating control individuals of similar age and imagery ability as the self-mutilators, to determine their responses. Imagery scripts were based on the content of actual episodes described by self-mutilators. From the literature, it was expected that the administration of standard imagery to individuals with a wide range of imagery abilities would elicit one of two results. For those with good imagery ability, it was anticipated that the psychophysiological response would alter as a function of the degree of reaction normally experienced to injury and the sight of blood. For example, those who generally were distressed by the sight of blood would produce an anxiety response, whereas those who generally were not perturbed by the sight of blood would experience no increase in arousal at all. Individuals with poor imagery ability would not react in a manner consistent with imagery script content because they would be unable to adequately image an event they had not experienced. The total result would be little reaction to self-mutilation imagery.

Experiment 2

Method

Participants

Fifteen men participated in this study; they were selected from a subject pool to match the original self-mutilating group in terms of age and

imagery ability using the Betts QMI Vividness of Imagery Scale scores. All participants were psychology students at the University of Tasmania, and they received course credit. The nature of the study was explained to them, and written informed consent was obtained.

Materials

The VASs administered to participants in this study were the same as those used in Experiment 1.

Imagery Scripts

Three standard imagery scripts were constructed. Two were self-mutilation scripts that followed as closely as possible the details of an actual episode of self-mutilation. The first incorporated response elements of how the individual should be feeling and reacting (self-mutilation response), and the second contained only stimulus details (self-mutilation stimulus). A standard neutral script also was constructed and consisted of the details of making a cup of coffee. The neutral script contained no description of affect or psychophysiological response due to the nature of the event.

Script construction with regard to length and content of each stage was identical to Experiment 1. The content of the self-mutilation scripts was a compilation of elements from a variety of scripts of actual self-mutilative episodes.

Apparatus

Psychophysiological recordings were made using Chart 3.3.5 on a Macintosh IIci computer linked to a Maclab/8 Data Acquisition System. Recordings were made at 1 mm/s^{-1}, with a sampling frequency of 200 samples/s^{-1}.

The following parameters were measured: FBV, electrocardiograph (ECG) integrated through a cardiotachometer to achieve a mean HR, skin conductance response (SCR), electromyogram (EMG) from the frontalis muscle, and RESP.

Electrode placements for FBV, HR, CMAX, SCL, and earth reference were the same as those used in Experiment 1. EMG was measured from the frontalis muscle using two miniature Gereonics Ag/AgCl electrodes placed on the left mid-pupillary line at positions ⅓ and ⅔ above the supra-orbital margin. Measurement of RESP was by a Vitalog Respiration Sensor band around the upper thorax.

Procedure

The procedure was the same as for Experiment 1. At the conclusion of the experiment, participants were debriefed. Considerable time was taken in this process due to the nature of the imagery script content.

Data Transformation and Scoring

As scripts were standardized, a scoring period of 30 s, 15 s into each stage of each script, was selected. Average HR (beats per minute) and SCL (umho) represented the mean level of arousal during the scoring period. CMAX was not transformed. Respiration was calculated in breaths per minute.

Initially, a within-group analysis was conducted. Script (neutral, self-mutilation response, self-mutilation stimulus) × Stage (scene setting, approach, incident, consequence) ANOVAs were performed. A comparison was made of the responses to self-mutilation imagery by nonmutilators with that of the response to imagery of actual self-mutilative episodes of the self-mutilators (n = 18) in the previous experiment. The response script and stimulus script results of the nonmutilators were compared separately with the actual self-mutilation script results. As the data acquisition systems for each study were different, only directly comparable data were used. In this case, Group (self-mutilators, nonmutilators) × Script (actual self-mutilation, self-mutilation response/self-mutilation stimulus) × Stage (scene setting, approach, incident, consequence) ANOVAs were performed. (The use of multivariate ANOVAs was precluded by the ratio of participants to dependent variables; Tabachnick & Fidell, 1989.)

Results

Nonmutilation Group

A comparison was made of the responses to the two types of self-mutilation imagery and neutral imagery. Within-group repeated measures ANOVAs of the psychophysiological data demonstrated only one significant result, a main effect for script type for CMAX, $F(2, 28) = 3.74$, $p < .05$. In this case, the neutral script was associated with consistently low arousal, whereas the two self-mutilation scripts evoked a response associated with high arousal at Stage 3 with the description of cutting. Figure 4 depicts this arousal pattern.

No Script × Stage interactions were evident for any of the psychophysiological variables. The means and standard deviations for the psychophysiological measures for all stages of all scripts are presented in Table 3.

Script Type × Stage interactions were evident for the VASs: relaxed–tense, $F(6, 84) = 3.87$, $p < .005$; relaxed–anxious, $F(6, 84) = 4.58$, $p < .003$; calm–angry, $F(6, 84) = 4.28$, $p < .002$; and normal–unreal, $F(6, 84) = 5.62$, $p < .001$. For the other VASs, significant main effects for script type were evident: unafraid–afraid, $F(2, 28) = 23.34$, $p < .000$; happy–sad, $F(2, 28) = 47.80$, $p < .000$; and relieved–uptight, $F(2, 28) = 54.74$, $p < .000$. For all VASs, the neutral script was experienced significantly more positively than either of the self-mutilation scripts. There were no differences in the responses to the two self-mutilation scripts. An example of this reported psychological response is presented in Figure 5. The means and standard deviations for the psychological responses to all stages of all scripts are presented in Table 4.

For the VAS unclear–clear (which measures clarity of imagery), the neutral script was significantly clearer for participants than either of the self-mutilation scripts, $F(2, 28) = 5.46$, $p < .02$. There was no difference in the clarity of imagery for the two self-mutilation scripts. No stage effect or Script × Stage interaction was evident. This difference in reported clarity is presented in Figure 6.

Comparison With Self-Mutilators

Comparisons were made for FBV, HR, CMAX, RESP, and all VASs. When comparing self-mutilation scripts for the two groups, Stage × Group interactions were evident for FBV (actual vs. stimulus scripts), $F(3, 90) = 4.88$, $p < .03$; FBV (actual vs. response scripts), $F(3, 90) = 4.85$, $p < .03$; CMAX (actual vs. response scripts), $F(3, 90) = 4.09$, $p < .02$; and RESP (actual vs. stimulus scripts), $F(3, 93) = 2.96$, $p < .05$. The patterns of arousal to real and standard self-mutilation scripts were quite distinct. Figure 7 presents an example of the two response patterns.

For the VAS data, Stage × Group interactions were evident

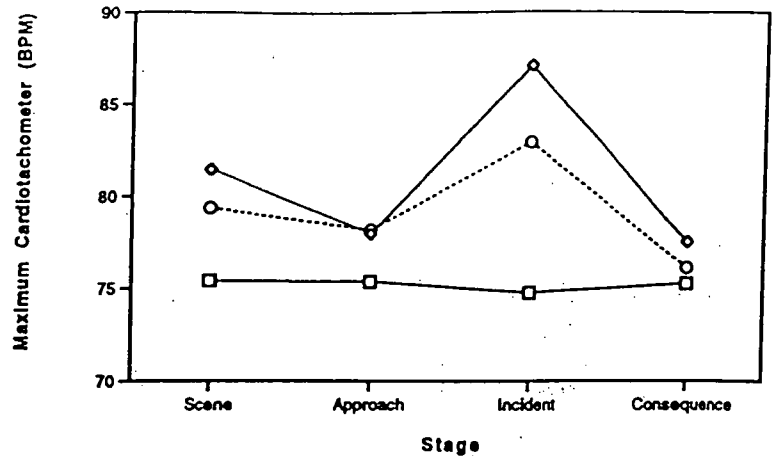

Figure 4. Patterns of psychophysiological arousal for maximum cardiotachometer for each stage of each script. (Squares represent the neutral script; diamonds represent the self-mutilation response script; and circles represent the self-mutilation stimulus scripts. BPM = beats per minute.)

for relaxed–tense (actual vs. stimulus scripts), $F(3, 93) = 8.81$, $p < .001$; relaxed–tense (actual vs. response scripts), $F(3, 93) = 4.87$, $p < .006$; relaxed–anxious (actual vs. stimulus scripts), $F(3, 93) = 9.04$, $p < .001$; relaxed–anxious (actual vs. response scripts), $F(3, 93) = 3.14$, $p < .03$; calm–angry (actual vs. stimulus scripts), $F(3, 93) = 3.66$, $p < .02$; unafraid–afraid (actual vs. stimulus scripts), $F(3, 93) = 3.07$, $p < .04$; happy–sad (actual vs. stimulus scripts), $F(3, 93) = 13.28$, $p < .001$; happy–sad (actual vs. response scripts), $F(3, 93) = 5.40$, $p < .005$; normal–unreal (actual vs. stimulus scripts), $F(3, 93) = 9.32$, $p < .001$; normal–unreal (actual vs. response scripts), $F(3, 93) = 8.07$, $p < .001$; relieved–uptight (actual vs. stimulus scripts), $F(3, 93) = 5.07$, $p < .004$; and relieved–uptight (actual vs. response scripts), $F(3, 93) = 3.14$, $p < .04$. An example of the differences in response patterns is displayed in Figure 8.

Table 3
Means and Standard Deviations of the Psychophysiological Measures for Each Stage of the Three Scripts for All Groups

Dependent variable	Neutral				Self-mutilation stimulus				Self-mutilation response			
	Scene	Appr.	Incid.	Cons.	Scene	Appr.	Incid.	Cons.	Scene	Appr.	Incid.	Cons.
FBV												
M	−.04	−.06	−.14	−.25	−.01	−.01	−.01	−.01	−.02	−.02	−.05	−.02
SD	.07	.10	.17	.54	.03	.07	.10	.12	.03	.07	.15	.09
HR												
M	69.28	69.15	68.37	68.34	69.80	69.79	68.73	67.57	71.86	70.53	70.49	70.57
SD	18.19	17.76	17.59	17.22	18.47	16.99	16.79	17.18	20.66	18.57	17.41	18.83
CMAX												
M	75.40	75.33	74.73	75.27	79.33	78.13	82.87	76.13	81.40	77.93	87.07	77.53
SD	18.69	18.87	18.90	18.15	18.42	18.95	29.01	18.33	22.46	18.68	24.27	20.19
EMG												
M	7.07	7.01	6.85	6.77	7.55	7.34	7.77	7.35	6.36	6.58	7.93	6.91
SD	5.45	5.33	5.15	4.93	4.24	4.04	3.88	3.76	3.23	3.07	5.36	3.43
RESP												
M	15.30	16.20	16.08	15.77	16.41	15.93	16.48	16.01	16.20	16.57	16.50	16.50
SD	1.99	1.51	1.68	1.72	2.01	2.16	2.03	1.97	2.70	1.99	2.48	2.65
SCR												
M	1.39	1.23	1.15	1.09	2.13	2.19	1.96	1.44	1.99	2.19	2.53	2.59
SD	1.95	2.20	2.44	2.92	2.87	3.63	3.38	3.18	2.92	3.32	3.41	3.55

Note. Appr. = approach; incid. = incident; cons. = consequence; FBV = finger blood volume (in millivolts); HR = heart rate (in beats per minute); CMAX = maximum cardiotachometer (in beats per minute); EMG = electromyogram (in microvolts); RESP = respiration (in breaths per minute); SCR = skin conductance response (in micromhos).

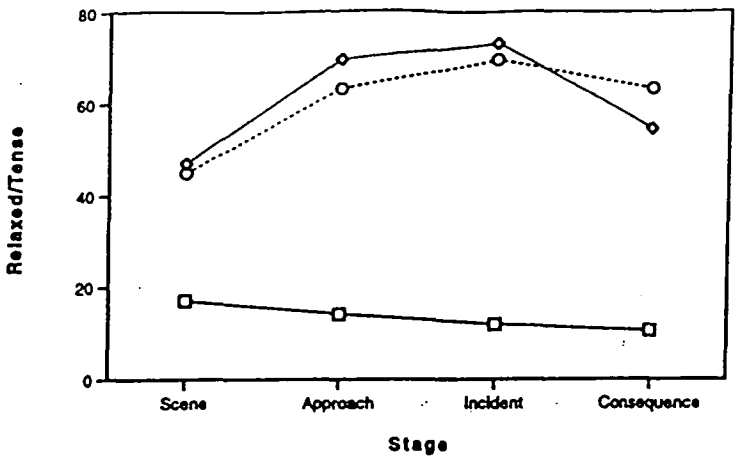

Figure 5. Patterns of subjective arousal for the relaxed–tense measure for each stage of each script. (Squares represent the neutral script; diamonds represent the self-mutilation response script; and circles represent the self-mutilation stimulus script.)

Discussion

It was predicted that the administration of standard self-mutilation imagery to a nonmutilating group would result in response patterns unlike the tension reduction pattern evidenced when self-mutilators were asked to image an actual episode of self-mutilative behavior. Results supported this proposition.

It was hypothesized that a tension reduction pattern of psychophysiological arousal would not be evident for nonmutilators, even though we used guided imagery as a means of eliciting

Table 4
Means and Standard Deviations of the Subjective Measures for Each Stage of the Three Scripts for All Groups

Dependent variable	Neutral				Self-multilation stimulus				Self-multilation response			
	Scene	Appr.	Incid.	Cons.	Scene	Appr.	Incid.	Cons.	Scene	Appr.	Incid.	Cons.
Relaxed–tense												
M	17.07	14.13	11.93	10.47	44.73	63.00	69.47	62.80	46.87	69.53	73.07	54.07
SD	18.48	13.62	12.97	11.21	29.07	25.47	17.29	25.18	27.58	22.95	20.50	27.65
Relaxed–anxious												
M	17.80	13.07	12.33	10.07	44.00	60.67	67.93	62.60	49.67	69.40	68.40	48.87
SD	19.39	13.37	17.80	13.35	27.22	21.80	20.58	23.23	27.91	24.03	20.56	27.65
Calm–angry												
M	12.67	11.60	10.47	9.33	48.67	50.20	42.60	42.67	57.67	59.07	39.47	33.07
SD	15.33	10.18	10.63	10.12	28.53	26.77	21.49	20.11	28.54	25.89	18.00	17.88
Unafraid–afraid												
M	11.33	12.33	12.73	12.40	26.13	41.87	36.20	42.07	62.53	43.13	38.80	37.33
SD	15.33	13.94	13.44	15.22	19.19	26.15	19.45	26.71	29.29	26.52	22.21	22.84
Normal–unreal												
M	12.67	12.27	10.73	8.80	31.40	46.53	58.80	55.67	37.73	48.87	67.07	55.93
SD	17.33	10.75	12.94	11.04	25.77	24.15	28.83	31.35	29.55	24.80	19.51	30.09
Happy–sad												
M	30.40	28.47	26.20	22.20	61.40	61.73	62.60	61.60	64.87	62.07	62.27	52.60
SD	15.53	12.70	12.40	14.52	16.79	15.80	13.47	12.27	18.72	13.89	15.71	15.01
Relieved–uptight												
M	34.87	34.33	32.47	27.87	66.93	73.13	61.00	53.60	69.67	76.13	60.00	48.53
SD	14.70	12.89	14.83	11.84	16.74	11.97	19.49	22.54	22.64	12.55	19.94	20.34
Unclear–clear												
M	89.13	89.20	89.60	91.47	80.20	76.47	76.73	76.40	74.60	78.27	79.67	76.20
SD	11.70	8.44	9.95	8.95	16.02	21.37	22.69	27.67	18.70	17.79	20.95	25.95

Note. Appr. = approach; incid. = incident; cons. = consequence.

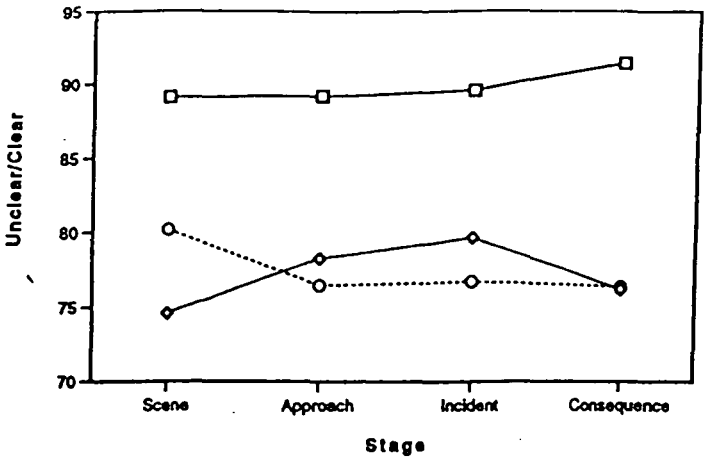

Figure 6. Patterns of response to the unclear–clear measure for each stage of each script. (Squares represent the neutral script; diamonds represent the self-mutilation response script; and circles represent the self-mutilation stimulus script.)

a psychophysiological response. The literature clearly states that the use of personalized imagery is superior to standard imagery in eliciting such a response (Pitman et al., 1987, 1990). That different patterns of response were evident for self-mutilators administered personalized imagery and nonmutilators administered standard imagery of an event they had never experienced supports the notion that it is the memory of the actual event that produces the psychophysiological arousal changes and not some experimenter-controlled variable.

Discussions of self-mutilative behavior in the literature indicate that arousal changes to self-mutilation develop over time. The four-stage methodology was applied to self-mutilative behavior in an attempt to chart this change. For the self-mutilators, measures of psychophysiological arousal evidenced significant across-stage changes that coincided with descriptions of the self-mutilative process. All significant measures demonstrated a tension reduction pattern associated with wrist cutting. For the nonmutilators, only one measure demonstrated

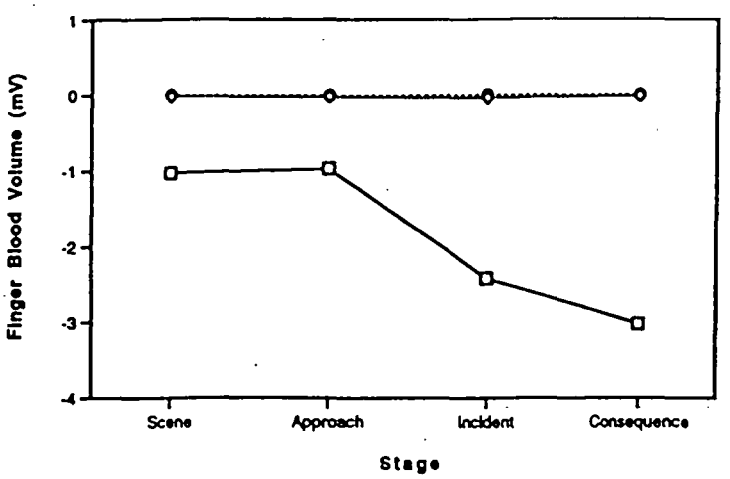

Figure 7. A comparison of the psychophysiological response of finger blood volume between the mutilators and nonmutilators for each stage of each script type. (Squares represent the actual self-mutilation script; diamonds represent the self-mutilation response script; circles represent the self-mutilation stimulus script.)

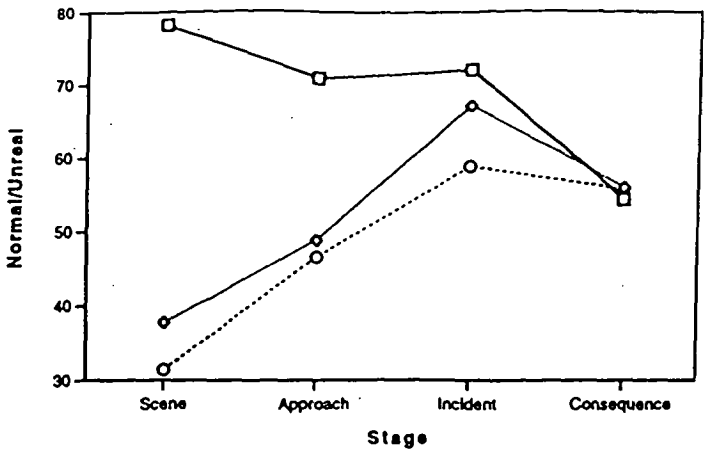

Figure 8. A comparison of the subjective response to the normal–unreal measure between the mutilators and nonmutilators for each stage of each script type. (Squares represent the actual self-mutilation script; diamonds represent the self-mutilation response script; and circles represent the self-mutilation stimulus script.)

significant differences across stages, and for this measure, the change was in the direction of increased arousal for wrist cutting. Indeed, the greatest increase was associated with response imagery that contained information indicating decreased arousal with wrist cutting. There was nothing to suggest that the guided imagery methodology was eliciting psychophysiological arousal patterns in a false or biased manner.

Subjective ratings of arousal and distress evidenced patterns dissimilar to those reported by actual self-mutilators to a memory of a self-mutilative episode. Whereas overall ratings by the nonmutilators were higher for self-mutilation imagery than neutral imagery, this is not surprising given the content of the imagery scripts. No extreme emotion generally is associated with coffee making. Ratings of discomfort or distress are elevated by the mere mention of personal injury, blood, and maladaptive responses to events with which most people are able to cope. However, it is interesting to note that ratings to self-mutilation imagery for the nonmutilation group were elevated overall and did not follow script content. For example, no reduction in rating was evidenced at Stages 3 and 4, even though imagery scripts contained "instructions" to participants to stop being concerned or distressed. Whereas subjective ratings indicated that participants were not comfortable with discussions of wrist cutting, the psychophysiological results did not indicate that they were so overaroused that changes across stages would be masked.

It also was hypothesized that imagery ability would influence the results. The literature suggests that individuals with good imagery ability are better able to produce a psychophysiological response consistent with imagery content (Lang, 1979). The use of personalized imagery has been adopted to overcome differences in imagery ability (Pitman et al., 1987, 1990). Simply put, individuals with imagery ability rated at average or below would be expected to image events with which they were familiar. Results support this proposition. Nonmutilators rated the clarity of neutral imagery significantly better than the clarity of self-mutilation imagery. Neutral imagery was of coffee preparation, a familiar task for most people. However, it proved to be more difficult to achieve a vivid and clear representation of the events surrounding wrist cutting, a behavior in which none of these participants had ever engaged.

The inclusion of response elements in the self-mutilation scripts administered to nonmutilators did not appear to alter arousal levels in either direction, despite suggestions that response elements enhance the psychophysiological arousal to imagery (Hirota & Hirai, 1986; Lang et al., 1980). The research investigating the efficacy of response versus stimulus imagery has relied on imagery presented in a single block or script. The use of the four-stage methodology with personalized imagery administered to individuals with high and low imagery ability also demonstrated that the influence of response or stimulus elements was negligible (Brain et al., 1993). It would appear that both the use of personalized imagery and the presentation of imagery in four stages to a degree compensates for the lack of response elements. These results indicate that it is possible to use an imagery methodology with a group even if they are unable to recall psychophysiological responses associated with a particular event and relate them to the interviewer for inclusion in an imagery script.

It would be preferable to compare the responses of both self-mutilators and nonmutilators to standard self-mutilation imagery. (Given the intensity of the response to actual self-mutilation, individuals would be anticipated to relate their real experiences to the standard imagery and the results would mimic those to personalized imagery.) However, there seems to be little benefit in including a control self-mutilation imagery script for nonmutilating control groups, when an investigation of the responses to self-mutilative behavior is being conducted. It would

appear that the four-stage, guided imagery methodology is sensitive enough to elicit realistic responses to the memory of an event without unduly influencing responses.

General Discussion

If it can be determined that the experimental results have provided support for the tension reduction model of self-mutilation, the understanding of the development and maintenance of self-mutilative behavior will be enhanced. It would appear that the rewarding tension reducing qualities of the self-mutilative act reinforce and maintain the behavior as an effective, although maladaptive, coping strategy. Whereas previous research was derived solely from clinical impressions and self-reports, the inclusion of psychophysiological data may allow further delineation of the self-mutilative process.

The research findings may have important implications for clinical management of self-mutilative behavior. Few clinical interventions have been reported and they have, for the most part, been simplistic (Rosen & Thomas, 1984). It would appear that there is a lag between the psychophysiological and the psychological responses to the self-mutilative act. An understanding of the psychophysiological process and the clearer delineation of the related subjective experiences should facilitate the accurate description of target behaviors and the timing of behavioral and cognitive-behavioral interventions (Williams & Hart, in press).

It has been recommended that the assessment of discrete psychiatric entities should consider all areas of human response including psychophysiological reactions (Calhoun & Resick, 1993). The results of Experiment 1 support this proposition because of the different responses of participants to psychological and psychophysiological measures. The four-stage guided imagery methodology appears to provide the means of accurately assessing psychophysiological responses to behaviors normally difficult to access experimentally. It provides the potential for understanding the development and maintenance of a wide range of discrete psychiatric disorders such as obsessive–compulsive disorder, phobia, eating disorders, substance abuse, generalized anxiety disorder, and posttraumatic stress disorder.

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The Psychopathology of Incarcerated Self-Mutilators

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Objective: To investigate the symptomatology of severe psychopathology reported by male incarcerated self-mutilators. Method: Comparisons were made with a nonmutilating incarcerated group and a nonincarcerated, nonmutilator group. Results: A distinctive pattern of symptomatology emerged. Self-mutilators evidenced a wide range of elevated scores on general measures of psychological/psychiatric symptoms, particularly depression and hostility. Aspects of hostility that distinguished self-mutilators from other groups included the urge to act out hostile feelings, critical feelings towards others, paranoid feelings of hostility and guilt. Self-mutilators demonstrated substantial problems with substance abuse, particularly alcohol. Conclusion: A pattern of passive-aggressive, schizoid and avoidant personality styles distinguished self-mutilators from other groups.

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Self-mutilation may be defined as deliberately inflicted and often repetitive, low lethality self-injurious behaviour, of a socially unacceptable nature, performed in the absence of conscious suicidal intent and at a time of psychological crisis (1). It is reported to be a common clinical phenomenon although there are no fully adequate studies of incidence (1,2). Despite this, there is agreement that the prevalence of self-mutilative behaviour is high among certain populations such as delinquent adolescents, general psychiatric patients, particularly those with personality disorders, and incarcerated adults (1,3-6). The ratio of female self-mutilators to male is now accepted to be close to equal (1.5:1) (1,5).

The DSM-IV does not classify self-mutilation as a separate disorder although it is associated with Borderline Personality Disorder, Dissociative Identity Disorder, Sexual Masochism, and Trichotillomania (7). Low lethality self-mutilation is rarely associated with psychoses although individuals with schizophrenia do engage in more bizarre and severe forms of the behaviour (1). However, a variety of other diagnoses have been applied to self-mutilators (8).

Associations between self-mutilation and antisocial and histrionic personality characteristics have been reported (9,10) along with narcissistic and schizotypal personality traits (5,11). Despite the strong association between personality disorder and self-mutilation, few systematic studies have been reported (12). Nevertheless, the most common diagnosis is that of Borderline Personality Disorder (4,9,10, 13-15). There is support in the literature for the association between self-mutilation and Borderline Personality Disorder (12,16) and examination of the criteria for the disorder fits with the understanding of self-mutilation (1). It has been suggested that self-mutilation may be an indicator of severe Borderline Personality Disorder (12). Certainly, when compared with controls matched for the presence and type of personality disorder, self-mutilators have demonstrated greater psychopathology related to the traits of Borderline Personality Disorder. Although some assume that self-mutilation and a diagnosis of Borderline Personality Disorder go hand in hand, it would be incorrect to accept that all self-mutilators fit the criteria for the presence of a Borderline Personality Disorder (17).

Self-mutilators have higher levels of depression than control groups (2,13,18-20). Whether depression is an antecedent or a consequence of self-mutilative behaviour is not clear (20). It appears that there are qualitative differences in the depression experienced by self-mutilators when compared with psychiatric controls. When compared with depressives, self-mutilators more commonly reported guilt, sense of punishment, self-dislike, self-punitiveness, and body image problems. Depressives more commonly reported crying, sleep disturbance, fatigue, loss of appetite, somatic preoccupation and loss of libido (19). When compared with personality-disordered controls, vegetative symptoms were largely absent but greater levels of anxiety, somatisation and cognitive disturbance were present for self-mutilators (12). A labile mood is more characteristic of self-mutilation than prolonged depressive episodes (4). Certainly, anxiety, tension and depressed feelings are reported to be precipitating states to self-mutilation (2,19).

Escalating anxiety has been identified as an element o self-mutilation phenomenology (2). In brief, the individu experiences mounting negative feelings to the point wher he/she depersonalizes (although depersonalization is not

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necessary condition for the act of self-mutilation (4)). This is followed by painless cutting. With the sight of blood, the self-mutilator repersonalizes and the negative feelings rapidly dissipate (21). Certainly, self-mutilators have reported higher levels of anxiety than both depressives and nonmutilating, nondepressed controls (19).

Substance-use disorders have been reported among self-mutilators (4,18,22,23). Alcohol has been implicated as the most commonly abused substance (4,14,24,25) with periodic rather than chronic alcoholism being reported (14). There is relatively limited information available concerning the link between illicit drug use and self-mutilation although it has been suggested that self-mutilators are easily addicted (11,13,26). Almost half (48%) of girls admitted to a drug rehabilitation program reported engaging in self-mutilative behaviour and for the majority, the onset of the behaviour occurred prior to admission (17). There is a higher incidence of self-injury in orally dependent drug abusers than in intravenous users. However, the incidence is relatively high in both groups (23). Hallucinogens have been reported to be highly anxiety provoking for self-mutilators. Amphetamines are generally more popular (4).

The nature of self-mutilative behaviour, and the psychopathology associated with it in self-mutilating prisoners, mirrors that found in psychiatric patients. Examination of the incidence of self-mutilation in prisoners demonstrates high rates of the behaviour (4-6,27) and this represents a significant problem in the prison system (28-31). Only 10% of self-harm acts in prisons are reported to pose a serious suicidal risk (6). With every act of self-harm treated as potentially life-threatening (32), the behaviour places significant demands on prison resources.

Self-mutilation in prison is associated with severe psychopathology (33). Factors that differentiated self-mutilators from a general prisoner sample included drug abuse, repeated outbursts of rage or fighting, withdrawal and incommunicativeness, self-destructive behaviours other than slashing, anxiety, and a tendency to blame the environment (34). However, contradictory results have been obtained. When a sample of incarcerated male delinquents with a history of self-harm were compared with a sample referred for psychiatric evaluation without a history of self-harm, the self-harm group demonstrated more aggressive and noncompliant behaviours. It was not the level of distress that distinguished the groups but a range of behavioural difficulties that had been present prior to incarceration (35). In addition, self-mutilating prisoners and nonmutilating prisoners have been demonstrated to have comparable levels of anxiety (36) and use of drugs (37).

The inconsistent results may be due to the elevated levels of psychopathology evident in the general prison population (38,39). High rates of substance-use disorders (39-41) with 75% to 80% of prisoners reporting a life problem with substance abuse (40), depressive disorders (39,41,42) including dysthymia (42), anxiety/somatoform disorders, obsessive-compulsive symptoms (39) and personality disorders, particularly antisocial personality disorder (39,42), have been demonstrated in general prison populations There is increased likelihood of a history of attempted suicide (39). These rates were reported to be higher than the prevalence rates for the general population (39,42). In contrast, psychotic disorders were relatively uncommon (41,43).

It would appear that being incarcerated can result in increased levels of symptomatology in the absence of any preexisting disorder although certain disorders, such as substance dependence, must have been present prior to imprisonment (44). A sharp rise in symptomatology has been reported within the first 72 hours of incarceration (43,44). The increase is less dramatic for individuals with a previous history of psychological disturbance (44). Symptom levels then decrease over time as the individual adjusts to confinement (43,44). For example, depression and anxiety levels have lessened after 5 days within the prison environment (44).

It is necessary to determine if there is a diagnosis that can be consistently applied to self-mutilators or if there is a pattern of symptomatology that would identify these individuals. To determine the nature of the psychopathology specific to incarcerated self-mutilators, it must be determined that the self-mutilators display levels of psychopathology over and above that experienced in the general prison population.

Method

Participants

A total of 51 male participants were employed in this study. Three groups were compared. The first group (self-mutilators) comprized 19 prisoners with a history of self-mutilation. The second group (prisoner controls) was made up of 14 prisoners with no history of self-mutilation. The final group (nonprisoner controls) included 18 undergraduate university students with no history of self-mutilation or criminal incarceration. All groups were matched for age. The prisoner groups were matched for duration of present prison sentence as psychiatric symptomatology has been demonstrated to alter as a function of sentence length (43,44).

Materials

The nature and extent of self-mutilative behaviour were examined using a structured interview. Consideration was given to the frequency and duration of the behaviour, methods employed, instruments used to self-mutilate and site of injury. Examination also was made of any history of attempted suicide.

A number of instruments were used to assess symptomatology. The SCL-90-R (45) is a symptom checklist which provides measures of 9 psychiatry symptom dimensions: Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation and Psychoticism. In addition, 3 global indices of the psychological distress associated with the presence of symptomatology are provided: the Global Severity Index (GSI) - a single summary score of the current level of psychopathology; the Positive Symptom Distress Index (PSDI) - a measure of perceived distress separate from the number of items endorsed; and the

Positive Symptom Total (PST) - a measure of the extent of symptomatology. A measure of "caseness" is provided being 2 or more dimensions having a score equal to or greater than 63.

The Hostility and Direction of Hostility Questionnaire (HDHQ) (46) was used in conjunction with the SCL-90-R to investigate the nature of hostile feelings. Subscales are available for Urge to Act Out Hostility, Self Criticism, Criticism of Others, Paranoid or Projected Hostility and Guilt. A global score is available along with a measure of the direction of hostile feelings (i.e., intropunitive or extrapunitive).

The Michigan Alcoholism Screening Test (MAST) (47) and a drug-use screening instrument were administered to investigate the extent of substance use problems. The MAST investigates the behavioural, interpersonal and help-seeking patterns of individuals who abuse alcohol. The drug-screening instrument investigates behavioural, interpersonal, medical and psychological difficulties associated with the use of drugs other than alcohol.

The personality characteristics of the sample were considered using the MCMI (48) which measures basic personality patterns and pathological personality disorders. This test also provides information regarding clinical syndromes. A score of 75+ suggests the presence of a disorder and a score of 85+ suggests the disorder has prominence. While a revised version of the test is available, lack of a manual scoring method makes its use in research limited.

The Jail Stress Scale (49) was administered to account for the stress/distress engendered by the prison environment in the 2 prisoner groups. The scale was modified, adding items of relevance to sentenced prisoners. The resultant instrument had 11 items rated on a scale of stress from 1 = no stress, to 5 = extreme stress.

Procedure

The self-mutilators were identified by the forensic staff at the Special Institution Hospital at HM Prison Risdon and appropriate prisoner controls were approached to participate in the study. Prisoner subjects were interviewed in the hospital and the nonprisoner controls were interviewed at the university. All tests were verbally administered to circumvent potential problems with literacy in the prison sample. Participation was voluntary and written informed consent was obtained after the nature of the study was explained.

Results

Because of the large number of dependent measures, a Bonferroni correction was applied to all analyses of variance to control for Type I error, dividing the 0.05 probability level by the 40 dependent measures, resulting in a significance level of 0.001. However, because the sample size was relatively small, use of this level of significance may have created Type II errors, so comment will be made on trends up to the 0.05 probability level.

Description of Sample

The self-mutilation group had a mean age of 22.47 years (SD = 4.97), the prisoner control group 22.56 years (SD = 5.06) and the nonprisoner control group 22.28 years (SD = 4.66). There were no significant differences between the groups in terms of their age ($F [2,48] = 0.07$, $p > 0.05$). The mean duration of sentence at time of interview for the self-mutilators was 14.15 months (SD = 13.18) and the prisoner controls 20.85 months (SD = 18.98). The difference was not significant ($t = 1.04$, $df = 24$, $p > 0.05$). A comparison of the 2 prisoner groups in the reaction to the prison environment demonstrated no significant difference ($t = 0.39$, $df = 31$, $p > 0.05$). The self-mutilators achieved a mean score of 27.16 (SD = 9.86) and the prisoner controls 24.57 (SD = 10.13). These scores were indicative of little stress experienced as a result of the prison environment.

History of Self-Mutilation

The self-mutilators had deliberately injured themselves a mean of 48.05 times (SD = 111.95) with a range of 1 to 500 self-mutilative episodes reported. While the highest figure was only an estimate and seems exceedingly high, the complex network of scarring on the subject's skin provided convincing evidence that the estimate was realistic. Given the fact that 2 subjects reported an excessively high number of injurious episodes (200 and 500 respectively), a more appropriate measure of frequency is a median score. The median number of self-mutilative episodes was sixteen.

The mean duration of self-mutilation was 6.09 years (SD = 5.57) with a minimum of 0 years (i.e., within 1 year prior to interview) and a maximum of 22 years duration. The last act of self-mutilation occurred a mean of 7.62 months prior to interview (SD = 11.90) with a range of 0 (i.e., less than 1 month before interview) to 55 months. Suggesting that the behaviour was not a product of institutionalization in this sample, 78.95% had engaged in self-mutilative behaviour prior to any incarceration.

Examination of prior suicide attempts of the 3 groups demonstrated that 80.9% of self-mutilators, 15.4% of prisoner controls, and no nonprisoner controls had a history of self-destructive behaviour. These differences were significant, with more self-mutilators than statistically expected reporting episodes of attempted suicide ($\chi^2 = 30.74$, $df = 2$, $p < 0.001$). The self-mutilators had made a mean of 14.76 attempts (SD = 24.68) and prisoner controls 1.5 (SD = 0.5). Of those subjects who had attempted suicide, the most common method was by drug overdose (76.5%). Other methods included severe stabbing (47.1%), hanging (35.3%), ingestion of poisonous substances other than drugs (17.6%), gunshot (17.6%), electrocution (17.6%), precipitation (11.8%), and self-poisoning with carbon monoxide (5.9%).

Symptomatology

A comparison between the 3 groups was made of the standard scores on the 9-symptom dimensions and the 3 global indices of the SCL-90-R. The mean scores and standard deviations are presented in Table I. Substantial differences between the groups were evident on 5 of the

Table I

The Mean Standard Scores and Standard Deviations for the Subscales and Global Indices of the SCL-90-R*

DIMENSION	SELF-MUTILATORS	PRISONER CONTROLS	NORMAL CONTROLS
Somatization	59.32	56.50	56.89
	11.65*	14.46*	8.55*
Obsessive-Compulsive	65.21	62.64	65.44
	11.33*	11.33*	6.95*
Interpersonal sensitivity	66.53	60.79	60.61
	13.49*	12.86*	10.61*
Depression	72.74	61.43	60.50[a]
	10.31*	15.19*	9.34*
Anxiety	68.37	60.93	56.83[b]
	13.50*	16.24*	10.44*
Hostility	67.37	55.14	59.56[b]
	12.92*	13.00*	9.59*
Phobic anxiety	63.84	55.93	53.22[b]
	11.07*	12.05*	8.52*
Paranoid ideation	65.26	61.50	58.28
	13.37*	11.03*	9.99*
Psychoticism	67.89	60.07	57.11[b]
	9.79*	11.92*	10.59*
GSI	70.63	63.29	62.50[b]
	10.94*	13.36*	7.85*
PST	63.53	57.21	60.72
	7.14*	10.08*	6.51*
PSDI	63.95	61.36	57.33[b]
	9.11*	10.17*	4.68*

*Standard deviations; [a]$p < 0.001$; [b]$0.05 > p > 0.001$.

9 subscales. The Depression subscale scores were significantly different ($F\ [2,48] = 8.86, p < 0.001$). The scores of the self-mutilators were significantly higher than the prisoner controls (Fisher LSD = 8.18) and the nonprisoner control group (Fisher LSD = 7.63). No difference between the 2 control groups was evident. Scores on the Anxiety subscale indicated noteworthy differences ($F\ [2,48] = 4.59, p < 0.02$). The self-mutilators had higher Anxiety scores than the normal controls (Fisher LSD = 8.83) but scores of the prisoner controls did not differ from either the self-mutilators or the nonprisoner controls. Hostility scores were substantially different for the groups ($F\ [2,48] = 6.33, p < 0.004$). The self-mutilators had substantially higher scores than the prisoner controls (Fisher LSD = 8.41) and the nonprisoner control group (Fisher LSD = 8.51). No difference between the 2 control groups was evident. Phobic Anxiety scores evidenced some difference ($F\ [2,48] = 3.68, p < 0.04$). The

Table II

The Mean Scores and Standard Deviations to the Subscales of the Hostility and Direction of Hostility Questionnaire for the Three Groups*

HOSTILITY SUBSCALES	SELF-MUTILATORS	PRISONER CONTROLS	NORMAL CONTROLS
Urge to act out hostility	9.16	6.29	4.61[a]
	2.36*	3.15*	1.88*
Criticism of others	9.53	7.71	5.83[a]
	1.50*	2.49*	2.89*
Paranoid hostility	4.16	3.36	0.61[a]
	2.01*	1.60*	0.92*
Self-criticism	6.37	4.57	4.17[b]
	2.34*	3.34*	2.64*
Guilt	5.00	2.79	1.56[a]
	1.60*	2.22*	1.50*
Total hostility score	34.21	24.71	16.77[a]
	7.02*	9.53*	6.67*
Direction of hostility	-4.53	-5.43	-1.17
	5.70*	7.03*	7.19*

*Standard deviations; [a]$p < 0.001$; [b]$0.05 > p > 0.001$.

self-mutilators had higher Phobic Anxiety scores than the nonprisoner controls (Fisher LSD = 6.97) but scores of the prisoner controls did not differ from either the self-mutilators or the normal controls. For the Psychoticism subscale ($F\ [2,48] = 4.42, p < 0.02$), the self-mutilators achieved higher scores than the nonprisoner control group (Fisher LSD = 7.06) but no other differences were evident.

Examination of the global indices indicated substantial differences for the GSI ($F\ [2,48] = 4.91, p < 0.02$) with differences being evident between the self-mutilators and both the prisoner controls (Fisher LSD = 0.42) and the nonprisoner controls (Fisher LSD = 0.39), and for the PSDI ($F\ [2,48] = 7.04, p < 0.003$) with a difference being evident between the self-mutilators and the nonprisoner controls (Fisher LSD = 0.38).

The HDHQ was administered to examine the nature of hostile feelings experienced by the 3 groups. The mean scores and standard deviations of the 3 groups on the scales of the HDHQ are included in Table II. There were significant differences between groups for the total hostility score ($F\ [2,48] = 23.95, p < 0.001$). The self-mutilators reported significantly higher scores than the prisoner controls (Fisher LSD = 5.43) and the nonprisoner controls (Fisher LSD = 5.07). In addition, the prisoner controls scored significantly higher on this scale than the nonprisoner controls (Fisher LSD = 5.50). A significant result also was obtained on the Urge to Act Out Hostility subscale ($F\ [2,48] = 16.20, p < 0.001$). Self-mutilators scored significantly higher than the prisoner controls (Fisher LSD = 1.74) and the nonprisoner controls (Fisher LSD = 1.62). The scores of the 2 control groups were

comparable. Significant differences were apparent for the Criticism of Others subscale (F [2,48] 11.46, $p < 0.001$). Self-mutilators scored significantly higher than the prisoner controls (Fisher LSD = 1.66) and the nonprisoner controls (Fisher LSD = 1.55), and the prisoner controls scored significantly higher than the nonprisoner controls (Fisher LSD = 1.68). The Paranoid or Projected Hostility subscale demonstrated significant differences (F [2,48] = 24.99, $p < 0.001$) with the self-mutilators scoring significantly higher than the nonprisoner controls (Fisher LSD = 1.05) and the prisoner controls scoring significantly higher than the nonprisoner controls (Fisher LSD = 1.13). The 2 prisoner groups' scores were comparable. Significant differences were evident for the Guilt subscale (F [2,48] = 18.16, $p < 0.001$). Self-mutilators scored significantly higher than the prisoner controls (Fisher LSD = 1.25) and the nonprisoner controls (Fisher LSD = 1.16). The 2 control groups obtained comparable scores. A noteworthy result was obtained for the Self-Criticism subscale (F [2,48] = 3.32, $p < 0.05$) with the only significant difference being obtained between the self-mutilators, who reported higher levels of self-criticism, and the nonprisoner control group (Fisher LSD = 1.82). All groups recorded scores of outward or extrapunitive hostility. No significant differences between the 3 groups were evident (F [2,48] = 1.93, $p > 0.05$).

Consideration also was given to the clinical syndromes derived from the MCMI. Table III presents the mean adjusted scores and standard deviations for the 3 groups. A significant result was obtained for the Alcohol Abuse subscale (F [2,48] = 13.20, $p < 0.001$). Self-mutilators scored significantly higher than the nonprisoner controls (Fisher LSD = 11.30) as did the prisoner controls (Fisher LSD = 12.25). The 2 prisoner groups obtained comparable scores. A significant result also was obtained for the Drug Abuse subscale (F [2,48] = 10.67, $p < 0.001$) with self-mutilators (Fisher LSD = 10.48) and prisoner controls (Fisher LSD = 11.35) scoring significantly higher than the nonprisoner controls. Again, the prisoner groups achieved comparable scores.

Noteworthy results were obtained on a number of other subscales. Group differences were evident on the Anxiety subscale (F [2,48] = 4.34, $p < 0.02$) with self-mutilators obtaining a significantly higher score than the nonprisoner controls (Fisher LSD = 14.79). Other group means were comparable. Scores on the Psychotic Thinking subscale distinguished groups (F [2,48] = 5.31, $p < 0.007$) again with self-mutilators obtaining a significantly higher score than the nonprisoner controls (Fisher LSD = 9.77) but no other differences being evident. Group differences were obtained on the Dysthymic subscale (F [2,48] = 6.65, $p < 0.003$) with self-mutilators scoring significantly higher than the prisoner controls (Fisher LSD = 14.83) and the nonprisoner controls (Fisher LSD = 13.84). The control groups' scores were comparable. The other noteworthy result was obtained for the Psychotic Depression subscale (F [2,48] = 6.30, $p < 0.004$) with the self-mutilators scoring significantly higher than the prisoner controls (Fisher LSD = 12.53) and the nonprisoner control group (Fisher LSD = 11.70). The 2 control groups obtained similar scores.

Table III

The Mean Scores and Standard Deviations for the Clinical Syndrome Scales of the MCMI for the Three Groups

CLINICAL SYNDROME	SELF-MUTILATORS	PRISONER CONTROLS	NORMAL CONTROLS
Anxiety	81.05	70.00	59.39[b]
	20.75*	23.39*	23.20*
Somatoform	64.84	60.36	56.11
	16.81*	23.35*	16.85*
Hypomanic	67.32	56.64	60.89
	27.17*	28.78*	25.05*
Dysthymic	79.53	62.64	54.94[b]
	16.80*	23.08*	23.05*
Alcohol abuse	82.32	71.86	53.67[a]
	12.96*	19.96*	18.51*
Drug abuse	91.68	84.00	67.94[a]
	15.98*	18.84*	12.93*
Psychotic thinking	68.10	61.79	52.33[b]
	13.26*	13.34*	17.14*
Psychotic depression	64.26	51.07	43.89[b]
	14.39*	19.17*	19.57*
Psychotic delusions	62.74	55.86	52.78
	15.93*	20.85*	19.42*

*Standard deviations; [a]$p < 0.001$; [b]$0.05 > p > 0.001$.

The high scores on the substance abuse subscales of the MCMI were further investigated with the MAST and the drug-use screening instrument. With a higher score indicating more alcohol dependence, the self-mutilation group achieved a mean of 29.33 (SD = 13.86), the prisoner control group a mean of 20.36 (SD = 13.18) and the nonprisoner control group a mean of 4.78 (SD = 4.96). Analysis demonstrated significant differences between groups (F [2,47] = 21.90, $p < 0.001$). Self-mutilators scored significantly higher than prisoner controls (Fisher LSD = 8.06) and nonprisoner controls (Fisher LSD = 7.54) with prisoner controls also scoring significantly higher than nonprisoner controls (Fisher LSD = 8.06).

Significant differences between groups were evident for scores on the drug-abuse screening instrument (F [2,48] = 13.36, $p < 0.001$). The mean score for the self-mutilators was 6.11 (SD = 3.07), for the prisoner controls 4.14 (SD = 3.06) and the nonprisoner controls 1.39 (SD = 2.09). Self-mutilators (Fisher LSD = 1.84) and prisoner controls (Fisher LSD = 1.97) scored significantly higher than the nonprisoner control group. The scores of the 2 prisoner groups were comparable. Figure 1 presents the percentage of participants in each group reporting drug use in each category. More participants than statistically expected in both prisoner

Table IV

The MCMI Scores and Standard Deviation for the Basic Personality Pattern Scales of the MCMI for the Three Groups

BASIC PERSONALITY PATTERN	SELF-MUTILATORS	PRISONER CONTROLS	NORMAL CONTROLS
Schizoid	79.26	72.14	43.17[a]
	17.79*	24.42*	29.41*
Avoidant	82.26	64.79	45.17[a]
	27.28*	26.04*	30.60*
Dependent	61.68	60.57	55.61
	33.42*	30.12*	27.22*
Histrionic	68.53	68.00	72.22
	20.47*	18.11*	19.52*
Narcissistic	69.00	69.29	71.56
	21.61*	21.54*	21.26*
Antisocial	75.05	67.57	68.56
	22.39*	25.80*	17.07*
Compulsive	23.95	40.21	53.11[a]
	19.18*	23.15*	16.34*
Passive-aggressive	88.63	69.79	50.94[a]
	24.71*	29.61*	24.44*

*Standard deviations; [a]$p < 0.001$.

groups reported using tranquillizers (χ^2 = 17.29, df = 2, $p < 0.001$) and hypnotics ($c^2 = 7.14$, df = 2, $p < 0.04$) than the nonprisoner controls. More self-mutilators than statistically expected reported using stimulants (c^2 = 14.46, df = 2, $p < 0.001$) and hallucinogens ($c^2 = 8.47$, df = 2, $p < 0.02$) than both control groups.

Personality

The mean scores and standard deviations for the basic personality patterns of the MCMI are presented in Table IV. Group differences were evident on the Schizoid subscale (F [2,48] = 11.21, $p < 0.001$). Self-mutilators scored significantly higher than the nonprisoner controls (Fisher LSD = 16.02) as did the prisoner controls (Fisher LSD = 17.35). The scores obtained by the 2 prisoner groups did not significantly differ. The Avoidant scale demonstrated group differences (F [2,48] = 8.01, $p < 0.001$) with the self-mutilators obtaining a score significantly higher than the nonprisoner controls (Fisher LSD = 18.64). No other differences were evident. The groups significantly differed on the Passive-Aggressive subscale (F [2,48] = 9.68, $p < 0.001$). Self-mutilators (Fisher LSD = 18.44) and prisoner controls (Fisher LSD = 18.66) significantly differed from the nonprisoner controls. The score of the self-mutilators also was significantly higher than the prisoner controls (Fisher LSD = 17.22). The significant result for the Compulsive subscale (F [2,48] = 10.47, $p < 0.001$) demonstrated a different pattern. In this case, the nonprisoner controls obtained the highest score and the self-mutilators the lowest. Significant differences were evident between the self-mutilators and the prisoner controls (Fisher LSD = 13.76) and the self-mutilators and the nonprisoner controls (Fisher LSD = 12.85).

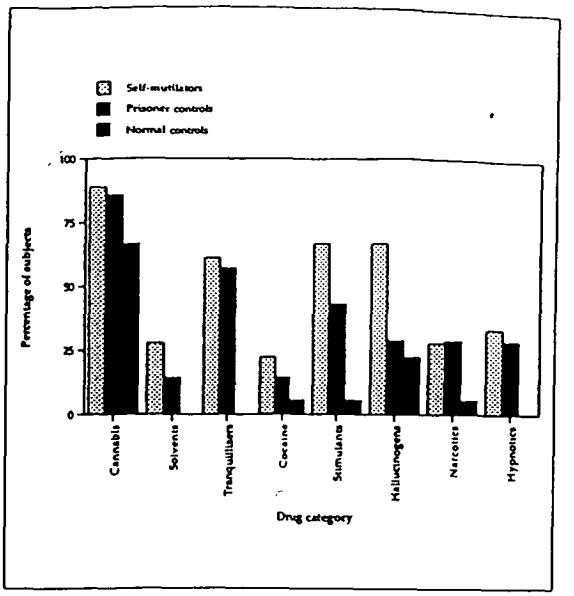

Figure 1. The percentage of subjects in each group reporting use of drugs in the various categories.

The MCMI provides 3 pathological personality disorder scales. The mean adjusted scores and standard deviations for the 3 groups are presented in Table V. The Borderline subscale demonstrated a significant effect (F [2,48] = 8.12, $p < 0.001$). The self-mutilators scored significantly higher than the prisoner controls (Fisher LSD = 10.49) and the nonprisoner controls (Fisher LSD = 9.80). The 2 control groups obtained comparable scores. Of note, substantial differences were evident for the Schizotypal subscale (F [2,48] = 4.21, $p < 0.03$). In this case, the only significant difference was between the self-mutilators and the nonprisoner controls (Fisher LSD = 9.58) with the self-mutilators scoring higher than the other groups.

Discussion

The self-mutilative behaviour of this sample of male prisoners was comparable to descriptions in the literature (1,5,14,33,50). A history of attempted suicide was much more evident for the self-mutilators. The literature indicates that suicidal gestures are distinguishable from self-mutilative acts (1,4,5,14,22) and certainly the suicide attempts of this sample were more life-threatening and included quite lethal methods such as hanging and gunshot.

Self-mutilators in this sample were characterized by severe psychopathology that was not associated with the stress of being incarcerated. Clinical interpretation of the data in terms of "caseness" (45) demonstrated that the self-mutilators displayed a broad range of elevated scores with only the Somatization subscale scores falling below the standard score cut-off indicating severe and wide-ranging symptomatology.

Hostility was identified as a factor differentiating the self-mutilators from the control groups. The impulse or urge to act out hostile feelings, critical feelings toward others, paranoid feelings of hostility and feelings of guilt differentiated the self-mutilators from the control groups. In addition, criticism of others also distinguished the prisoner controls from the nonprisoner controls. Self-criticism, while differentiating the self-mutilators from the nonprisoner controls, did not distinguish either of these groups from the prisoner controls. The direction of hostility was extrapunitive for all groups. The hypothesis of self-mutilation representing aggression or rage turned inward was not supported in this sample.

In terms of the cut-off scores suggested by Millon (48), the Dysthymic, Anxiety and Alcohol Abuse subscales reached clinical significance only for the self-mutilators. Results for the Alcohol Abuse subscale were supported by the MAST data with the self-mutilators scoring significantly higher than both control groups on this test. While both prisoner groups achieved scores above cut-off for the presence of a disorder on the Drug Abuse subscale, data supported by the drug-abuse screening instrument, and the scores for the self-mutilators suggested that as a group their substance use disorder had prominence.

Therefore, in terms of symptomatology, the only factors that consistently distinguished the self-mutilators from both prisoner controls and nonprisoner controls were depressive/dysthymic, hostility and substance abuse symptoms. The depression finding was unequivocal. All measures suggested the presence of a depressive disorder in the self-mutilation group. Most aspects of hostility, with the exception of self-criticism and the direction of hostility, distinguished self-mutilators from the other groups. However, when comparing the nature of crimes committed by the 2 prisoner groups, the self-mutilators were not more likely to have committed an act of violence such as assault, rape or murder. In addition, while elevated scores in both groups were apparent, the extent of substance abuse was markedly more severe among self-mutilators.

A pattern of passive-aggressive, schizoid and avoidant personality styles distinguished the self-mutilators from the other groups. Interestingly, antisocial personality traits did not distinguish the prisoner groups from the nonprisoner controls. This is contrary to findings that prisoners in general are antisocial (39-42), and self-mutilators are particularly so (9,34).

The passive-aggressive result cannot be ignored. Sixteen of the 19 self-mutilators evidenced this personality pattern. Examination of individual results demonstrated that 15 of these subjects had a prominent disorder according to Millon's (48) criterion. Although the passive-aggressive category has

Table V

The Mean Scores and Standard Deviations for the Pathological Personality Disorder Scales of the MCMI-II for the Three Groups

PATHOLOGICAL DISORDERS	SELF-MUTILATORS	PRISONER CONTROLS	NORMAL CONTROLS
Schizotypal	61.42	58.29	48.06[b]
	13.63*	11.88*	16.98*
Borderline	69.05	58.50	49.44[a]
	12.67*	14.98*	16.67*
Paranoid	74.16	65.29	61.29
	14.04*	20.49*	16.65*

*Standard deviations; [a]$p < 0.001$; [b]$0.05 > p > 0.001$.

been removed from the mainstream personality disorders in the DSM-IV (7) and it has been suggested that further research is warranted, the basic description of the passive-aggressive personality remains unchanged. The passive-aggressive or negativistic personality is characterized by labile affectivity with moodiness, low frustration tolerance and explosive episodes. These individuals display behavioural contrariness in that they are often petulant and gain gratification by undermining the happiness of others. A discontented self-image leads to pessimism and disillusionment. Interestingly, the passive-aggressive personality is associated with deficient regulatory controls. These individuals are impulsive and react inappropriately and negatively to external stimuli. Interpersonal relationships are difficult and characterized by swings between an acquiescent and dependent interpersonal style and assertive independence. They use sulky, unpredictable behaviours to engender negative feelings in others.

Aspects of the passive-aggressive personality are congruent with the understanding of self-mutilative behaviour. In particular, the erratic moodiness, low frustration tolerance, explosive episodes and interpersonal difficulties fit with descriptions of the escalating negative feelings as a consequence of inability to cope with stresses and perceived interpersonal loss and rejection that precede the act of self-mutilation (4). The impulsivity experienced by the passive-aggressive personality also is well documented in self-mutilators (4,5,51).

There is little information in the literature linking self-mutilation with passive-aggressive personality disorder. One study (37) reported this type of personality style in black prisoners and used the finding to explain the low rate of self-mutilative behaviour in this ethnic subgroup. The authors suggested that the outward direction of anger and aggression results in few self-harming episodes. However, the direction of hostility did not differentiate the 3 groups in this study. Self-mutilators were as likely to display extrapunitive feelings as the 2 control groups. Another study (52) linked a passive-aggressive personality along with schizoid, avoidant

and dependent traits to mood disturbance in combination with suicide ideation or suicide attempt. This pattern is similar to the schizoid, avoidant and passive-aggressive combination identified in this group of self-mutilators.

Whereas self-mutilators scored higher than normal controls on the Schizotypal and Borderline pathological personality disorder subscales, neither reached clinical significance in terms of Millon's (48) criterion. Indeed, only approximately one-third of the self-mutilators achieved a score suggestive of the presence of a borderline disorder. The severity of disorder for those exhibiting significant borderline traits was comparable to the prisoner control group.

In summary, the psychopathology in this sample of incarcerated self-mutilators was marked. They displayed patterns of symptomatology that distinguished them from prisoners with no history of self-mutilation and from nonprisoner controls with no history of self-mutilation or criminal incarceration. However, the pattern of symptomatology displayed was not entirely consistent with other reports in the literature. For example, while reported to be a concomitant of self-mutilation, levels of anxiety did not consistently distinguish the self-mutilators from prisoner controls. In terms of personality, the antisocial, narcissistic and histrionic personality traits reported in the literature were largely absent in this sample. As a group, the self-mutilators did not display borderline characteristics. Instead, this sample was characterized by passive-aggressive, schizoid and avoidant personality traits.

It would be reasonable to suppose that there are factors that influence the level and type of psychopathology in one sample of self-mutilators that would not influence another sample. The element that links different samples of self-mutilators is the phenomenology of the behaviour. It would follow, therefore, that the occurrence of self-mutilation should be viewed as the primary consideration in understanding the behaviour with the differing patterns of psychopathology being understood as secondary and treated symptomatically.

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Résumé

Objectif : Examiner la symptomatologie de la profonde psychopathologie manifestée par les hommes incarcérés chez qui on note de l'auto-mutilation. ***Méthode :*** *On a comparé 2 groupes : un groupe d'hommes incarcérés chez lesquels on rapportait de l'auto-mutilation et un groupe d'hommes incarcérés qui ne manifestaient pas d'auto-mutilation.* ***Résultats :*** *Un pattern caractéristique a émergé. On a noté chez les auto-mutilants une grande variété de mesures élevées de symptômes psychologiques/psychiatriques, en particulier en ce qui a trait à la dépression et à l'hostilité. Les aspects de l'hostilité qui distinguaient les auto-mutilants des autres groupes comprenaient le besoin d'extérioriser les sentiments d'hostilité, des sentiments de critique envers les autres et des sentiments paranoïdes d'hostilité et de culpabilité. On a noté chez les hommes qui manifestaient de l'auto-mutilation des problèmes significatifs de consommation abusive d'intoxicants, en particulier d'alcool.* ***Conclusion :*** *Un pattern de styles de personnalité passive-agressive, schizoïde et évitante distingue les auto-mutilants des autres groupes.*

THE SELF-MUTILATIVE NATURE OF SEVERE ONYCHOPHAGIA: A COMPARISON WITH SELF-CUTTING.

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ABSTRACT

Objective: To investigate the psychophysiological pattern associated with severe and mild onychophagia and to compare this pattern to that demonstrated by previous research for self-cutting. *Method:* Comparisons between the psychophysiological responses accompanying the three behaviours were made using a guided imagery methodology. Imagery of nail-related, skin-cutting and neutral events were presented in four stages. *Results:* Experiment I distinguished participants exhibiting severe onychophagia from those with mild on the basis of the severity and frequency of nail-biting and by the pattern of psychophysiological response across the stages. Experiment II indicated the change in psychophysiological arousal accompanying severe onychophagia was not as dramatic as that demonstrated for skin-cutting. The behaviour seems to be less effective in reducing tension. *Conclusion:* Severe onychophagia appears to act to manage the level of tension experienced by an individual, instead of dramatically reducing it in times of crisis. Such a process is consistent with that demonstrated in individuals with obsessive-compulsive disorder.

In clinical research, onychophagia has been compared to various nervous habits such as thumb-sucking, giggling, and twitching (1-4). Recognition by relatively few authors of a more severe category of onychophagia (5) has highlighted a lack of clear categorisation of these two quite distinct forms. Mild onychophagia has been described as a crude form of self-grooming in which nail length is controlled with the teeth (6). In comparison, the authors that have recognised the more severe nature of onychophagia in some individuals have defined it as "nails bitten beyond the free edge, with nail margin below the soft tissue border" (5, p.822).

A distinction between the severe and mild forms of onychophagia can be made. Treatments that have been designed for various nervous habits have been effective in the management of mild onychophagia (1,7,8) but not for the severe form (5). Severe onychophagia can be considered a different behaviour altogether on the basis of the degree of self-harm that is involved (9). Various reports have demonstrated serious medical complications associated with the severe form of onychophagia including bleeding, infection, scarring and significant pain (5,10-13) that are not present for the mild form. The most common medical problems have included acute paronychia which involves inflammation of the tissue adjacent to the nail, infection and pus formation (5). Osteomyelitis also may result which involves infection of the bone underlying the nail (14).

It is suggested that the tension reduction model of self-mutilation may usefully be applied to the severe form of onychophagia (9). This model suggests that self-mutilation acts as a drive reduction mechanism (15). Every time cutting occurs, a consequent reduction in tension results. Each time the individual engages in tension reducing, self-inflicted injury, the behaviour is reinforced and strengthened. The likelihood that the individual will engage in such behaviour when faced with a similar emotional situation is then increased. In this way, the behaviour is being negatively reinforced by the pleasant tension reduction (16,17). Classifying severe onychophagia as self-mutilative and subsequently applying the tension reduction model of self-mutilation may increase understanding of the aetiology and maintenance of this behaviour and improve the efficacy of treatment (9).

A strong argument can be made for a distinction between the mild and severe forms of onychophagia and for the self-mutilative nature of the severe form. To classify a behaviour as self-mutilative, it must be deliberately inflicted, repetitive, low lethality, socially unacceptable self-injury occurring as a consequence of psychological distress or crisis (18-20). Both forms of onychophagia can be considered to be deliberately inflicted and of a repetitive nature as they may occur many times a day. Both represent no threat to life, although severe onychophagia results in greater self-injury than the mild form. Mild onychophagia has been

suggested to be acceptable in a social context (20), and is considered a nervous habit rather than an indication of psychological distress (1). Severe onychophagia, in comparison, cannot be considered socially acceptable because of the consequences of the degree of self-injury taking place in a social setting (9). The psychological distress component of the definition makes a clear distinction between the two categories of onychophagia. The serious self-injury which occurs in those individuals who exhibit the severe form is indicative of significant psychological distress (5). Onychophagia may not have been labelled self-mutilative by the majority of authors because of the unremarkable nature of the mild form and the lack of recognition of the severe form. Alternatively, it may be due to the large number of individuals who engage in the behaviour.

Severe onychophagia has in fact been described as a compulsive form of self-mutilation (21,22) comparable in its intensity and degree of self-injury to behaviours such as trichotillomania (23,24), scab picking (25,26), skin scratching (6,27) and cheek biting (6,22). Such behaviours have been described as occurring automatically or without conscious intent in a repetitive, ritualistic pattern (22). In this respect they are phenomenologically similar to the compulsive rituals observed in patients with obsessive-compulsive disorder (OCD) (22). Compulsive self-mutilation has been associated with tension reduction (22).

If severe onychophagia can be considered self-mutilative, then the tension reduction model of self-mutilation may explain why this behaviour is maintained in the face of social repugnance and serious physical pain. In fact, several authors have suggested this process to be operating (1,2,11,22,28,29). Support for its operation has been demonstrated in several areas of clinical research on onychophagia. The most prominent symptom associated with this behaviour in adults has been an elevated anxiety level (30-32). Whether the two categories of onychophagia can be distinguished according to the level of anxiety which is associated with the behaviour needs to be further clarified.

Support for the operation of the tension reduction mechanism also was evident in the major theories addressing the aetiology and maintenance of onychophagia (1-33). In particular, learning theorists have speculated the individual who bites his or her nails has learned that the behaviour reduces the aversive state of elevated anxiety and tension. In this way the reinforcement processes are operant, causing the behaviour to be controlled by its consequences (34). Whether this reinforcement process occurs for both categories of onychophagia remains to be empirically tested.

Further support is demonstrated by the types of treatments that have been effective in the management of the severe category which have included covert sensitisation (35-37), aversive therapy (38,39) and relaxation training (28,40). All these treatments appear to effectively interfere with the reinforcement produced by the reduction of tension following the behaviour. Covert sensitisation and aversive therapy seem to train the individual to avoid their nail-biting behaviour by pairing it with an aversive stimulus whereas relaxation training provides an alternative method of tension reduction. The efficacy of these treatments in the management of severe onychophagia implies the importance of the role of antecedent (tension) and consequent (relief) events in the maintenance of this behaviour (36).

In summary, a distinction between the mild and severe categories of onychophagia was warranted (9). In fact, the severe category could be considered self-mutilative under the definition. Considering the severity of the injury inflicted, there is a need for greater understanding of the process which maintains the behaviour in order to improve treatment efficacy. Speculation as to the occurrence of a reinforcement process involving tension reduction indicates the need for investigation of the psychophysiological processes which accompany both categories of onychophagia.

Because it is not ethical or practical to request individuals to harm themselves by biting their nails for the purpose of research, a guided imagery methodology provides the most practical way of studying a psychophysiological pattern accompanying a behaviour. The method of presentation of imagery (in four stages) allows for examination of the reinforcement processes as they occur over time.

Previous research has demonstrated the validity of this methodology for skin-cutting (16,17), bulimia (41), alcohol relapse (42), obsessive-compulsive disorder (43), and self-poisoning (44).

The tension reduction response was observed using this methodology for skin-cutting with a peak of arousal levels in the second stage when the moments leading to cutting were described, and a reduction in arousal to the third stage when cutting occurred (16,17).

EXPERIMENT I

It is anticipated that participants who exhibit the severe form of onychophagia will demonstrate a higher overall level of arousal than the mild and control groups. The severe group is expected to demonstrate a pattern of tension reduction in response to imaged nail-biting behaviour. Individuals exhibiting mild onychophagia may experience some reduction in psychophysiological arousal because of the association of the behaviour with nervousness but not of the same degree as the severe condition. Control participants will exhibit little change in psychophysiological arousal levels across the stages.

METHOD

Participants

Participants were recruited from private clinical practice and from the undergraduate population of the University of Tasmania. An information sheet was given to all participants and written informed consent was obtained. Fifteen participants exhibited severe onychophagia, 15 exhibited mild onychophagia, and 15 had no history of onychophagia. Participants were allocated to the nail-biting groups according to a range of criteria. The severe group exhibited obvious physical damage to the cuticle and surrounding skin to the point where the nail was bitten beyond the free edge. A high intensity of nail-biting and degree of physical damage was observed. Those in the mild condition exhibited an absence of such physical damage and lower overall intensity of nail-biting.

Materials

A questionnaire was devised to record demographic variables, an assessment of severity and frequency of nail-biting, and the presence of other self-mutilative behaviours. A nail-biting severity scale that was constructed on the basis of the research of Leonard and colleagues (9) was administered.

Personalised imagery scripts of a nail-related and a neutral event (making a hot drink) were developed for each participant. They were divided into four stages that included: 'setting the scene' (the environment in which the behaviour occurred); 'approach' (the lead-up to the behaviour); 'incident' (a description of the actual behaviour); and 'consequence' (what occurred immediately after the behaviour had ceased). Only elements reported by participants were included in the scripts, where possible, in their own words.

Apparatus

Apparatus included a Macintosh Powermac 7200/75 computer linked to a MacLab/8s data acquisition system using Chart 3.5.1. Recordings were made at 1mm/s^{-1}, with a sampling frequency of 200 samples/s^{-1}. Heart rate data was taken from 7mm Ag/AgCl electrodes, one placed on each side of the rib cage along the lateral line with an earth on the mastoid process. A Pneumotrace strain gauge monitored respiration rate. Skin conductance level (SCL) was measured using 10mm Ag/AgCl electrodes on the first and third fingers of the non-dominant hand. Electromyography (EMG) was monitored by two 7mm Ag/AgCl electrodes placed 1/3 and 2/3 above the supraorbital margin.

Procedure

In an initial session, the questionnaire incorporating demographic variables, and frequency and severity of nail-biting was verbally administered. Participants then were interviewed about either a single event of nail-biting (for the severe and mild groups) or of nail-clipping (for the control group), and a neutral event (making a cup of coffee or tea). These events were either the most recently experienced or the most vividly recalled. The interview focused on both stimulus information such as where the participant was, what they could see or hear, and what was happening around them. and response information involving how the participant was feeling or responding to the events. The imagery scripts were then developed, with separate personalised scripts for each participant.

In a second session, electrodes were applied. Participants were informed that a baseline measure would be taken before the presentation of each script type. They were instructed that each stage of each script would last approximately 60 seconds and that there would be a brief pause in between each stage in which they would be instructed to open their eyes. The scripts were administered in a counterbalanced order.

Data transformation and scoring

A 30 second period was scored for each stage of each script. The scoring period was determined by the content of the personalised imagery scripts. Most commonly, the scoring period began 15-20 seconds from the beginning of the recording for each stage. This scoring system has been used successfully with other studies (16,17,41,44,45). Data relating to HR (in beats per minute) and RESP (in breaths per minute) were not transformed. EMG was integrated and the score obtained from this integration. SCL represented a mean level of the scoring period.

RESULTS

Description of the nail-biting sample

There was a significant difference between the groups in the self-reported frequency of nail-biting, $c^2(3, n=30)=11.41$, $p<.01$. A significantly greater number of participants in the mild (n=6) than the severe group (n=0) reported biting their nails less than once a day. Significantly more participants in the severe group (n=11) reported their biting to occur more than once a day as opposed to the mild group (n=4). However, there were no significant differences between the groups in the estimated number of times they had bitten their nails in the last day, week or month.

There was a significant difference between the mild and severe groups in self-rated severity of nail-biting, c^2 (2, n=30)=20.4, $p<.0001$. Significantly more participants than statistically expected in the mild group (n=11) than in the severe group (n=0) rated the severity of the biting as only trimming their nails. Significantly more participants in the severe group (n=9) than in the mild group (n=0) rated their biting as causing painful damage. In addition, there was a significant difference between the groups in the occurrence of bleeding following biting, $c^2(1, n=30)=13.39$, $p<.0003$, with more of the severe group (n=13) reporting bleeding than the mild group (n=3).

In addition, on the severity scale, the severe group rated themselves as spending significantly more of their time biting their nails in the last week, $t(28)=2.39$, $p<.03$, significantly higher intensity of the biting urge, $t(28)=3.14$, $p<.004$, and significantly higher interference with daily life, $t(28)=2.30$, $p<.03$, than the mild group. There were no significant differences between the groups in the resistance exerted against the urge to bite, or the distress caused by the biting.

A range of other self-injurious behaviours were noted in all three groups. Participants in the severe nail-biting group had engaged in skin-cutting (n=2), skin picking (n=4), cheek biting (n=2), hair pulling (n=4), eyelash pulling (n=1), and applying a caustic substance to the skin (n=1). Participants in the mild group reported having engaged in skin picking (n=3), cheek biting (n=2), and hair pulling

(n=7). Control participants reported skin picking (n=2), cheek biting (n=2), and hair pulling (n=1).

Response to imagery

Repeated measures ANOVAs with the Huynh-Feldt correction being applied were performed. A significance criteria of 0.05 was adopted for all analyses. All means and standard deviations are available from the authors upon request.

Respiration. A significant script by group interaction was evident for the respiration response as presented in Figure 1, $F(2,42)=4.56$, $p<.02$. The severe group demonstrated a significantly higher overall response than the control group to the nail-related script (Fisher PLSD=2.23, $p<.05$). The difference between the two nail-biting groups was not significant. There also was a significant main effect for script, $F(1,42)=8.31$, $p<.006$, indicating that the overall level of arousal shown in respiration was higher for all groups in response to the nail-related script than to the neutral script.

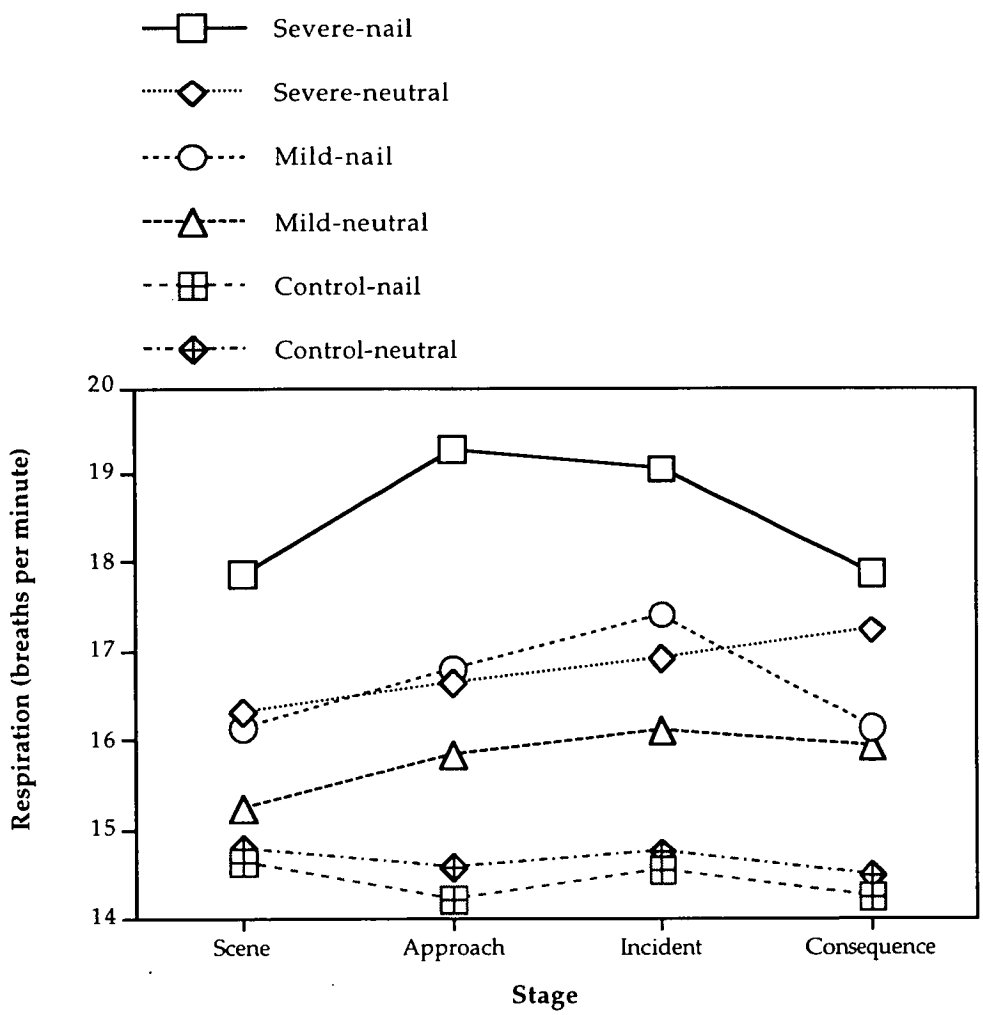

Figure 1. The pattern of psychophysiological response for respiration (in breaths per minute) in response to both scripts for all groups.

Muscle tension. A significant group by script interaction was evident, in the EMG response, $F(2,41)=3.31$, $p<.05$. Post hoc analyses demonstrated significantly higher overall levels of EMG in the response of the severe group to the nail-related script (M=249.66, SD=132.03), than to the neutral script (M=200.82, SD=92.96), $t(14)=2.53$, $p<.03$. No such differences were evident for the mild and control groups.

There also was a trend towards a script by stage interaction, $F(3,123)=1.91$, $p=.057$. The overall level of muscle tension was higher for the nail-related script than the neutral script at the approach, $t(43)=2.19$, $p<.04$, incident, $t(43)=2.81$, $p<.008$, and consequence stages, $t(43)=2.07$, $p<.05$.

Skin conductance level. A significant script by stage interaction was observed for the skin conductance response, $F(3,99)=3.512$, $p<.03$. Post hoc analyses demonstrated a significant difference in the response to the nail-related script between the scene and the consequence stages, the approach and consequences stages, and between the incident and consequence stages (Fisher PLSD=0.61, $p<.05$). A trend towards significantly higher SCL between the nail-related and the neutral scripts at the incident stage was evident from post hoc tests $t(35)=1.99$, $p=.054$.

Heart rate. There was a trend towards a script by stage interaction for the heart rate response, $F(2,3)=2.57$, $p=.064$. A significant difference for the severe group on the nail-related script between the scene and approach stages was evident (Fisher PLSD=1.754, $p<.05$). No such difference across stages was observed for the mild and control groups. Post hoc analyses also demonstrated a significant difference between the overall response to the nail-related script and the neutral scripts at the approach stage, $t(44)=2.91$, $p<.006$.

DISCUSSION

The study aimed to evaluate whether the two categories of onychophagia could be distinguished on the basis of the characteristics of the nail-biting and the psychophysiological response that accompanied imaging the behaviour. The nail-biting groups could be distinguished on the basis of the frequency and severity of the nail-biting, with the severe group reporting their biting to be significantly more frequent and to cause a higher degree of injury. This is consistent with the higher percentage of participants reporting bleeding as a result of nail-biting in the severe group.

The pattern of tension reduction that has been demonstrated in response to imaged skin-cutting involves a peak of arousal in the approach stage (just before self-cutting) and a decrease to the incident stage (where self-cutting occurs) (16,17). The respiration and heart rate responses of the severe group to their nail-related script mirrored this pattern of response, with the peak of arousal preceding the nail-biting and a decrease in arousal as the nail-biting was imaged. However, the difference between the stages did not reach significance.

However, levels of psychophysiological arousal did not consistently distinguish the severe and mild groups. The mild group reported engaging in a high number of other compulsive self-injurious behaviours. Considering the consensus in the literature that such behaviours may be tension reducing (6,20,22) this may have contributed to a lack of distinction in the psychophysiological response of the nail-biting groups. Perhaps a clearer distinction would result from exclusion of individuals engaging in other behaviours.

Nevertheless, the mild group demonstrated a different pattern of response across the stages to the severe group. Their response to the nail-related script involved an increase in respiration, muscle tension, skin conductance and heart rate at the incident stage (as they imaged biting their nails) and a decrease to the consequence stage (after they had stopped biting their nails). This pattern also occurred in the severe group for muscle tension. It is important to note that muscle tension is a more subjective psychophysiological measure due to the degree of control an individual has over his or her frowning.

The skin conductance response of the severe group indicated a reduction of arousal at the consequence stage but not before. This delay, in comparison with the early reduction of the heart rate and respiration responses, may well reflect the nature of the skin conductance response itself which has been determined to be vulnerable to such factors as imagery ability (46).

In summary, the pattern of heart rate and respiration response across the stages appears to be similar for the severe group in this study and the reported

pattern for individuals who engage in skin-cutting (16,17). This pattern does not seem to be occurring for the mild group. It would appear that the difference between severe onychophagia and skin-cutting is one of degree. To further investigate this proposition, a comparison would need to be made between groups of people engaging in onychophagia and a group engaging in skin-cutting.

EXPERIMENT II

METHOD

Participants

The severe and mild nail-biting groups from the previous experiment were included in this study. In addition, a sample of 67 individuals with a history of self-cutting were included; 29 females and 38 males. These individuals were contacted through private psychological practice, community mental health clinics, and an undergraduate university population. Written, informed consent was obtained from these individuals.

Apparatus

Psychophysiological recordings were made using Chart 3.4 on a Macintosh Quadra 840AV linked to a MacLab/8 data acquisition system. Recordings were made at $1mm/s^{-1}$, with a sampling frequency of 200 $samples/s^{-1}$. The electrode placements and psychophysiological parameters were the same as for the previous experiment except that EMG was not recorded.

Materials

A questionnaire was developed to obtain information from participants related to their self-mutilative behaviour. This information included type, frequency, duration, and last self-mutilative episode.

Participants were interviewed to obtain information for personalised imagery scripts of actual self-mutilative episodes. They were requested to describe the self-mutilative episode in terms of the environment in which it occurred, and their cognitive, psychological, behavioural and psychophysiological responses to the event. The information obtained during interview was limited to the minutes before, during and after the actual cutting incident to devise a guided imagery script that could provide a continuous sequence of events. The personalised imagery scripts were constructed in the same way as for the previous experiment.

Procedure

The procedure was the same as for the previous experiment.

Data transformation and scoring

The scoring of psychophysiological records and the management of data was the same as for the previous experiment with the exception that EMG was excluded.

RESULTS

Description of the sample

All participants had engaged in low lethality self-mutilative behaviour. All participants had cut themselves. In addition, a range of other self-mutilative behaviours were evident including self-burning, skin-scratching, skin-picking, self-hitting, and wound excoriation.

The participants reported a mean of 61 self-mutilative episodes (SD=93.0) with a range from 1 to 500 episodes. The participants had been self-mutilating for a mean of 43 months (SD=67.0). It had been a mean of 15 months (SD=19.0) since the last self-mutilative episode with a range from within the last month to 72 months. It has been demonstrated that the psychophysiological response of tension reduction is maintained even after a substantial period of not engaging in self-mutilative (16).

Response to imagery

Comparisons were made between the following groups' responses to imagery: severe nail-biting, mild nail-biting, and self-cutting. Repeated measures ANOVAs with a Huynh-Feldt correction were performed. A significance criteria of .05 was adopted for all analyses. All means and standard deviations are available from the authors by request.

A significant stage by group interaction was evident in relation to HR, $F(6,261)=4.16$, $p<.0008$. This interaction is presented in Figure 2. Post hoc analyses demonstrated that significant across stage differences were apparent for the self-cutting group, $F(3,177)=18.72$, $p<.0001$. Heart rate significantly increased from the first stage to the approach, with heart rate then decreasing from the approach stage to the actual incident of self-cutting. Arousal then remained low for the consequence stage but did not decrease further (Fisher PLSD=1.05, $p<.05$). A significant across stage difference also was apparent for the severe nail-biting group, $F(3,42)=2.91$, $p<.05$, with a significant increase from the first stage to the approach stage prior to biting beginning (Fisher PLSD=1.75). Although a reduction in heart rate was noted after this stage, the decrease was not significant. No across stage differences were apparent for the mild biting group.

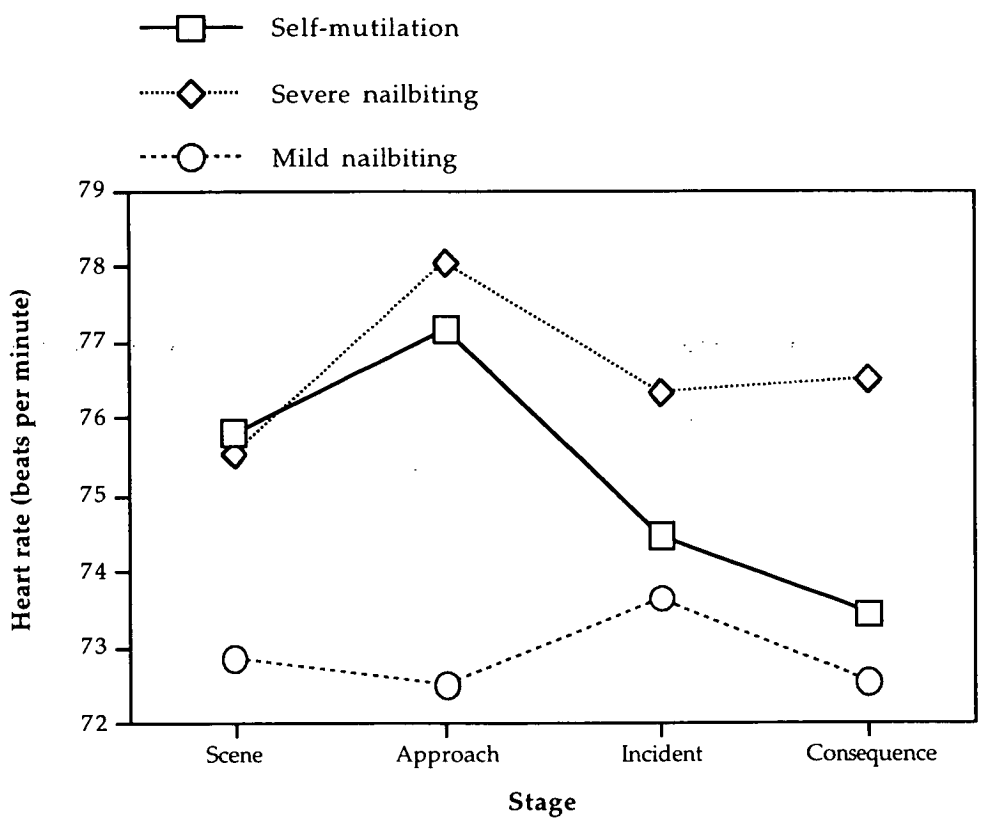

Figure 2. The pattern of psychophysiological response for heart rate (in beats per minute) to each stage for all the groups.

Figure 3 presents the significant interaction between stage and group for skin conductance level, $F(6,204)=2.32$, $p<.05$. For the self-cutting group, there was a significant pattern of arousal change across the stages, $F(3,132)=5.80$, $p<.0009$. In this case, there was a significant increase from the scene stage to the approach stage, followed by a significant reduction from the approach stage to the incident stage when self-cutting was described. Arousal remained at this low level for the consequence stage (Fisher PLSD=0.69, $p<.05$). There was a trend for an across stage difference for the severe nail-biting group, $F(3,33)=2.80$, $p=.055$. The significant decreases were apparent from the setting the scene stage to the consequence stage, and

from the incident stage to the consequence stage (Fisher PLSD=1.15, p<.05). No across stage differences were apparent for the mild nail-biting group.

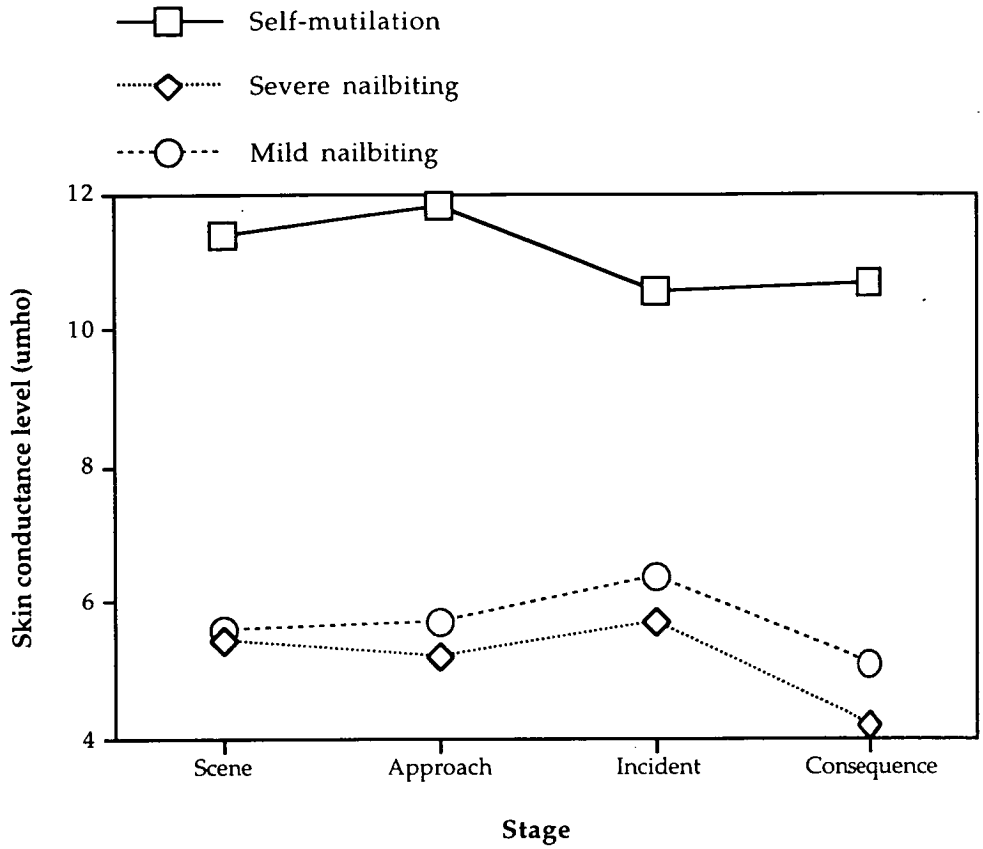

Figure 3. The pattern of psychophysiological response for skin conductance level for each stage for all groups.

With regard to respiration, there was a significant stage main effect, F(3,258)=4.92, p<.003. Disregarding group, there was a significant increase in respiration rate from the setting the scene stage to the approach stage, and a decrease from the approach stage to the incident stage. No further decrease was evident at the consequence stage (Fisher PLSD=0.63, p<.05).

DISCUSSION

The pattern of psychophysiological arousal demonstrated in heart rate for the nail-related script clearly indicate the different pattern across the stages for the severe nail-biting and skin-cutting groups as compared to the mild group. As is evident from experiment II, the skin-cutting group demonstrated a clear pattern of tension reduction whereas the severe nail-biting group demonstrated a pattern of tension alteration. Skin-cutting seems to be more effective in reducing tension than severe nail-biting which does not act as a catalyst for tension reduction in the same way. This is consistent with the description of skin-cutting as an acute, impulsive behaviour (22) and severe nail-biting as a more chronic, habitual behaviour (20,22).

It has been suggested that the chronic repetition of compulsive behaviours may have a desensitising effect resulting in reduced efficacy in producing relief from an aversive state (17,21). This has been suggested, in the case of skin-cutting, to result in an escalation of behaviour to a higher frequency and severity of cutting (21) and, in turn, higher risk of accidental death (47). The participants in the severe nail-biting group may have become desensitised to the tension altering effect of the behaviour

which may account for the significantly higher severity and frequency of nail-biting that was reported.

The tension reduction response of the severe nail-biting group did not reach a significant level. However, the efficacy of the covert procedures (35-37) and aversive therapies (38,39) in the treatment of severe onychophagia may indicate the process to be one of tension management rather than tension reduction at a time of psychological crisis. It has been documented that the ritualistic behaviours observed in individuals with OCD have a neutralising effect in that they retain the level of tension at a manageable level (48). Moderate anxiety levels have been associated with the performance of a compulsive ritual whereas maximal anxiety levels have been associated with the non-performance of a ritual (49). To explore the suggestion of tension management, it would be necessary to compare the psychophysiological response associated with severe nail-biting with a condition in which the response of severe nail-biting was prevented. If the level of arousal escalates in this condition (where the individual cannot manage his or her tension), it would suggest a process to be occurring similar to that in operation in individuals with OCD.

In fact, it has been speculated that the same biologic system mediates a spectrum of compulsive behaviours such as OCD, trichotillomania and severe onychophagia because of the management of these behaviours with the drug clomipramine hydrocholride (5). The phenomenological similarity between compulsive self-mutilation and OCD (with compulsions and few obsessions) is further supported by high comorbidity between OCD and trichotillomania (50).

A distinction between a severe and a mild form of onychophagia was suggested in consideration of the differing degrees of self-injury involved in the two forms. This study made this distinction on the basis of the differing characteristics of the behaviour (such as frequency, severity, and the occurrence of bleeding) reported by the participants. The pattern of psychophysiological arousal demonstrated by the participants in the severe nail-biting group was similar to that reported to occur for skin-cutting but the reduction of arousal occurred to a less pronounced extent. This indicated the possibility that severe onychophagia may be a behaviour that is similar to OCD in the way that tension is managed rather than dramatically reduced. The need for further empirical research of the psychophysiological pattern associated with low grade, compulsive, self-mutilative behaviours is indicated by this suggestion.

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